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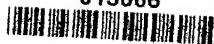
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OF

AGRICULTURAL ECONOMICS AND SOCIOLOGY

FARM ECONOMICS

Effects of the economic crisis on agricultural production in Czechoslovakia.

Agriculture in Czechoslovakia has been affected perceptibly by the world economic crisis. The constantly increasing surpluses of agricultural products have had a very great influence in lowering prices, as tariff protection of these products, especially farinaceous products, pigs and fats, was very inadequate in Czechoslovakia, while the other countries, Germany, France, Italy, protected themselves more effectively. On the other hand, the export of the excess of Czechoslovak agricultural products (sugar, barley, malt and timber) was checked in the importing States by the raising of their tariffs. These in certain cases had even assumed an almost prohibitive character, as for example those on malt and barley in Germany, those on refined sugar in England, etc.

It should be noted that the effects of the world crisis have been much more marked in Czechoslovakia than in other States, as the various measures for counteraction of the agricultural crisis have been taken only after considerable delay, in view of the highly delicate political preliminary negotiations. In addition these measures for the benefit of agriculture were inadequate, on account of the strong political opposition evoked. The comparison between the price levels and even, in a certain measure, between the intensity of the agricultural crisis in Czechoslovakia and the crisis in other States, made on the basis of international statistics, given in the "Bulletin mensuel de l'Office permanent à La Haye" can only be approximate. These statistics include the wholesale prices, as compared with the pre-war prices, as well as the indices of cost of living, foodstuffs only, calculated on the same basis.

Assuming that, before the war, a certain quantity of foodstuffs, say 100 units, could be exchanged for a fixed quantity of commodities, included in the general wholesale trade index (also 100 units), it is possible to establish the ratio between prices of agricultural products and those of other merchandise. Thus in Czechoslovakia, in 1927, the index of the products contained in the wholesale index was 979, while the index of foodstuffs was only 850. It follows that for this quantity of prewar food stuffs (100 units) only 87 units ($850 \div 979 \times 100$) can be obtained of these commodities included in the wholesale index, and not 100 as in 1914. The wholesale index includes not merely the indices of industrial but also those of agricultural products, and the wholesale price indices of agricultural products corresponds approximately to the index of food products or even are lower than this. The fact of the wholesale trade index being higher than that of food products indicates that the reason lies in the relative increase in the cost of manufactured goods. The

prices of manufactured goods have thus risen in Czechoslovakia more than those of food, that is to say of agricultural products (1).

If the purchasing power of foodstuffs in different countries is expressed, taking into account the wholesale price indices of the respective countries the results are as follows:

Assuming that in 1913 the price ratio was such that for 100 units of foodstuffs it was possible to purchase 100 units of commodities included under the wholesale trade index, it appears that in the course of recent years this quantity has undergone the following changes:

	1927	1928	1929	June 1930
Poland	121	119	126	121
United States	114	110	115	119
Switzerland	111	108	111	120
England	110	111	115	122
Germany	110	109	112	115
Spain	110	105	106	107
Italy	107	105	113	121
Canada	97	100	103	110
Hungary	95	95	103	109
Austria	90	92	94	100
Czechoslovakia	87	86	88	97
France	85	87	95	111

The effects of the economic crisis on agriculture in Czechoslovakia are thus especially pronounced.

Even if the preliminary calculation mentioned is only of a purely approximate character, it shows that in Czechoslovakia price conditions are peculiarly unfavourable to agriculture. These conditions are further aggravated by the relatively high customs duties protecting industrial production. During the inflation period 1919 to 1921, the import duties were gradually raised to 20 to 30 times the pre-war rates, but at the time of deflation in 1922, when the Czechoslovak crown rose in relation to the dollar in the proportion of 1 to 3, protection became naturally weakened. The partial reduction of the tariffs on manufactured in the commercial treaties did not show results equally tangible, as these tariffs were lowered from 10 to 20 times, while the customs protection of agricultural products up to 15 December 1930 only amounted to seven times the pre-war value.

(1) It is of course essential to take into account that there are included under the index of foodstuffs also imported agricultural products, also that the methods of calculation of these indices differ according to the country, and that, *e. g.*, under the Czechoslovakian wholesale trade index raw materials and semi-manufactured goods preponderate, so that if under that index the completely manufactured products were shown, the final calculation for agriculture would be still more unfavourable.

The cause of the economic crisis thus lies in the continual fall in the price of agricultural products which has occasioned a considerable diminution in the returns from agriculture, while the cost of the requisites for agricultural production and of the commodities required by the farmer in his household has not fallen in the same proportion.

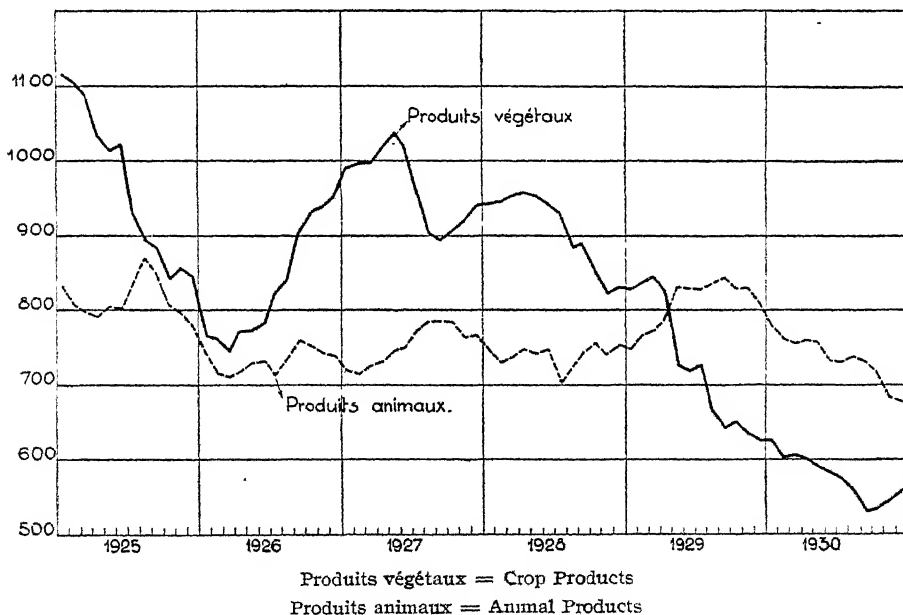
Prices of crop products have been since 1927 in a state of *continual decline*; from 1927 to December 1930 their fall was 40 per cent. on wheat, 58 per cent. on rye, 30 per cent. on barley, 42 per cent. on oats, 56 per cent. on peas, 30 per cent. on poppies, 88 per cent. on hops, 53 per cent. on potatoes and 18 per cent. on sugar beet.

Prices of animal products, already very low in 1927, have undergone further considerable decline up to the end of December. Thus for example the price of fatted cattle fell between 1927 and December 1930 by 9 per cent., that of cows by 8 per cent., calves by 10 per cent., pigs by 30 per cent., milk by 2 per cent., butter by 16 per cent. and the price of fowls by 7 per cent.

The Price Calculation Section of the Institute of Farm Accountancy and Rural Economy has found a method of learning in a more convenient way the fluctuation in the prices of agricultural products included in its calculated indices. These show the effects which the fall of prices had had on the farming receipts. The indices of the receipts for agricultural products show the average receipts of a farm belonging to the group of 5 to 20 hectares in the post-war years, assuming a constant annual sale quantity (1), measured on the basis of the average pre-war receipts

The evolution of the indices since 1925 is shown in Graph I.

GRAPH I. — *Index of the Prices of Crop Products and Animal Products in Bohemia.*
(Average for 1913-1914 = 100).



(1) The sales quantity was determined by enquiries made by the Institute of Farm Accountancy the period 1909 to 1913.

The weighted index of prices received by farmers in Bohemia for crop products fell markedly in the course of the second half of 1925 and the first half of 1926. The prices, in fact, dropped to seven and a half times the pre-war prices. The consequence of the fall of prices at that time was a strengthening of the customs protection which came into force on 14 July 1926. This measure and in particular the fall of prices on the world market improved the prices of crop products, so that in 1927, they reached the amount of ten and a half times as much as the pre-war prices; since the 1927 harvest, however, these prices have fallen steadily so that towards the end of December 1930 they stood at five and a half times the pre-war prices. Up to April 1929, the prices of crop products were more favourable than those of animal products. The prices of animal products fluctuated between seven and eight times the pre-war prices, but since May 1929 the prices of animal products have been higher than those of crop products and rose to eight and a half times the pre-war prices in the latter half of 1929. None the less they fell again and towards the end of 1930, they were only six and a half times higher than the pre-war prices.

The diminution of the receipts of the farmer since 1927 up to the end of December 1930, due to the fall in the price of crop products, is 42 per cent.; for animal products it is 10 per cent.

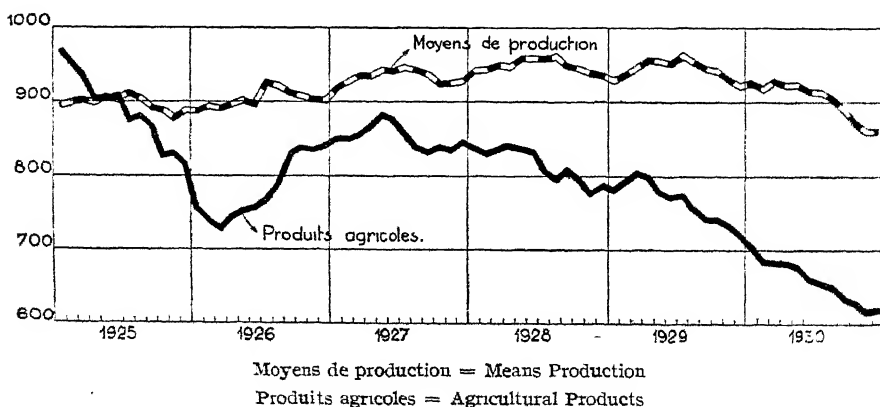
The decline in the total receipts of the farmer, due to the fall in prices since 1927 up to the end of December 1930, was on the average 27 per cent.

While the receipts for agricultural products were suffering from the exceptional price fall, *the expenses of the farmer have not similarly decreased*, and it is here that the cause must be sought of the heavy losses he has incurred in the course of recent years.

The indices of the expenses of the farmer, which like those of the receipts, are calculated in the Price Calculation Section of the Institute of Farm Accountancy and Rural Economy, are shown in Graph II.

GRAPH II. — *Index of the Prices of Agricultural Products (Receipts) and of the Means of Production (Expenditure) in Bohemia*

(Average 1913-14 = 100).



The index of agricultural expenditure from 1927 to 1930 shows a slight rise, and it is only after 1930 that it falls a very little.

While the agricultural receipts fall from 8.52 times the pre-war level in 1927 to 6.58 times in 1930, that is to say by 23 per cent., the agricultural expenditure during the same

period only falls from 9.33 to 9.03 times, that is to say, by 3 per cent. With the proceeds of his sales, the farmer buys a quantity which is steadily becoming smaller of the commodities he requires for his production. The exchange value of agricultural products for the requisites of agricultural production has fallen by 40 per cent. as compared with pre-war conditions.

This disparity of the prices of agricultural products and of farming requisites, assuming average harvests, amounts to almost 4.5 milliards of crowns for 1930. The farmer finds himself deprived of that sum, in favour of another party who would not have benefited under pre-war price conditions.

If the disparity between the prices of agricultural prices and the means of agricultural production is considerable, agricultural receipts, in relation to prices of articles of consumption necessary to the farmer's household, are still more unsatisfactory. The high price of clothing in particular adds greatly to the expenses of farmers, as to the expenditure of all other classes of society.

In December 1930 the prices for the clothing of a labouring family amounted to 9.37 times the pre-war prices; and in the case of the farming family prices have gone up almost in the same proportion. Since his receipts have fallen, in consequence of the fall of prices, by December 1930 to 6.19 times the pre-war prices, the farmer is buying clothing at 51 per cent. dearer than he is selling his products.

The decline of farming income appears from the study of the results obtained by the Institute of Farm Accountancy and Rural Economy by means of a system of double entry book-keeping, which it carries out for the farmers and which includes about 300 closures of accounts per year:

Year	1925	1926	1927	1928	1929
Farming income in %	100	100	109	91	74
Family consumption in % . . .	100	102	101	102	104
Percentage increase (1)	100	74	255	—	—
Percentage decrease (2)	—	—	—	105	480

The decline in the *farming income* (including the labour of the members of the family) began in 1928 and increased in 1929. Since 1928 the growing expenses for family consumption are no longer covered by the diminishing farming income, so that the difference has to be covered by *using up owned income*, or in any case by non-agricultural income. In 1930 conditions were still more unfavourable; but the precise figures have not yet been established by the Institute of Farm Accountancy and Rural Economy.

In consequence of the opposition of political parties, the support of the policy of the stabilisation of the prices of agricultural products in the parliamentary committees has been inadequate. The rapid progress of the crisis outstripped the measures relating to customs protection. The present crisis, which became more serious towards the end of May 1929 and which continued to increase in gravity, was not met by any changes in the customs tariff until the summer of 1930; but

(1) Farming income, after deduction for the consumption needs of the family.

(2) Family consumption, after deduction of the farming income; the decrease is expressed in percentage of the increase of 1925 which is taken as 100 per cent.

in consequence of the delay in the proclamation of the treaty with Hungary the arrangement made at that date could have no influence on the disposal of the 1930 crop. The customs protection of 1926 which was comparatively trifling as regarded imported agricultural products could not have full effect on prices, on account of the introduction of import permits and export premiums granted under various forms in the countries of exportation. Even the additional duty of 16 December 1930 imposed on live pigs has not checked the decline in the price of pigs, for in place of live pigs, pork is imported at much lower rates.

Czechoslovakian foreign trade is feeling the serious consequences of the agricultural crisis in the *considerable diminution in the surpluses* of the principal agricultural products for export (Table 1) and in the *relatively small decrease* in the quantity of farinaceous foodstuffs, meat and fats, which had to be imported from abroad to provide for consumption needs (Table 2).

TABLE 1. — *Surpluses of Barley, Malt, Hops, Sugar and Timber Exported from Czechoslovakia.*

	1927	1928	1929	1930
	in truckloads			
Barley	16,970	6,925	12,164	14,241
Malt	16,380	15,549	17,850	18,342
Barley and malt (1)	38,264	27,139	35,369	32,583
Hops	760	581	833	902
Sugar	63,065	83,526	61,211	58,639
Timber	288,810	216,451	123,994	95,502
	in millions of crowns			
Barley	319.9	133.5	195.6	177.3
Malt	474.9	474.5	501.8	334.4
Barley and malt	794.8	608.0	694.7	511.7
Hops	423.0	267.3	168.1	114.5
Sugar	1,498.3	1,582.8	1,034.0	799.6
Timber	904.2	619.3	284.4	266.1

Since 1927 the value of the export of barley and malt has diminished by 283 million crowns, that of hops by 309 million Kč, that of sugar by 698 million Kč, and the value of timber by 638 million Kč, hence by nearly 2 milliards in all.

(1) In the calculation of the export figure malt has been included in the barley: 100 kgs. of malt = 130 kgs. of barley.

TABLE 2. — *Deficit of Farinaceous Products, Meats and Fats in Czechoslovakia which must be Imported from Abroad.*

	1927	1928	1929	1930
	in truckloads			
Wheat	33,307	29,888	16,380	28,861
Wheat flour	17,442	17,445	16,328	18,921
Wheat semolina	149	195	191	184
Rye	16,663	10,263	—5,302	—3,232
Rye flour	355	418	30	— 9
Farinaceous products Total (1)	77,540	67,886	36,535	55,008
Beef (2)	555	139	1,520	1,695
Pork (4)	6,091	5,784	6,214	4,734
Fats and bacon	3,243	3,154	3,462	2,701
Meat products Total	9,889	9,077	11,196	9,134
Butter	60	— 14 (3)	6	1
	in millions of crowns			
Wheat	655.7	556.5	237.4	326.3
Wheat flour	516.5	486.5	397.8	412.5
Wheat semolina	4.6	5.4	4.8	4.3
Rye	279.5	177.4	—72.8	—26.5
Rye flour	8.3	10.0	0.6	— 0.1
Farinaceous products Total . .	1,464.0	1,235.8	567.8	716.5
Beef	61.7	9.1	203.2	211.8
Pork	634.9	652.6	713.3	450.2
Fats and bacon	374.7	343.6	363.6	260.5
Meat products Total	1,071.3	1,005.3	1,280.1	922.5
Butter	15.9	— 0.1	2.7	0.4

(1) The flours are reckoned in grain (wheat yields 65 per cent., rye 70 per cent. of flour).

(2) Including live cattle counted as meat (55 per cent.).

(3) Figures with a negative sign attached (—) represent the surplus of exports over imports.

(4) Including live pigs counted as meat (80 per cent.).

While the value of the deficits fell as between 1927 and 1930 by 912 million crowns, taking the principal agricultural products together, the value of the export surpluses of agricultural products fell by nearly two milliards. Hence the national economy of Czechoslovakia was impoverished by more than a milliard of crowns over this exchange of agricultural products.

In the course of the present crisis, Czech agriculture is suffering much from the disturbance of conditions of income. The consequences of the price crisis in agriculture appear in a way that causes anxiety in the trade balance, and the weakened purchasing power of the farmers has made itself felt finally in industry. Agricultural expenditure is estimated at about 10 milliards of crowns for farming alone and at 5.5 milliards for private expenses.

The decrease in the purchasing power of the farmer has obliged him to limit his consumption of manufactured products for personal use (especially textiles) and of such farm requisites as can be done without for the time being. These are in particular new buildings, new machinery and repairs. With the accentuation of the crisis, farmers have also effected economies in respect of those means of production which, supposing good prices are obtainable for agricultural products, tend to increase the farm returns. Thus curtailment took place of the purchases of chemical fertilisers, concentrated stock feeds, etc. The effects of the agricultural crisis passed from industry directly concerned with farming, *viz.*, the chemical fertiliser industry, farm machine manufacture, etc., to the other branches of industry as well as to trade. In consequence there were difficulties in payments and bankruptcies; the number of compositions with creditors rose from 2,148 in 1928 to 4,296 in 1930. Owing to the limitation, and in some cases the disappearance of industrial production, all overtime work was limited, and the number of unemployed persons, especially among the industrial workers, rapidly increased. From 34,341 unemployed in September 1929 it had become 104,543 in September 1930, in December 1930 it was 230,766 and towards the end of January 1931 it was 310,000, necessitating, apart from large sums given in allowances to the unemployed, considerable investments of funds in undertakings of the Public Administration, not without prejudicial results to the budget. On the other hand, the crisis brought about a diminution in the revenue of the State Administration, in particular owing to the falling off of traffic on the railways and the lowering of revenue from direct taxes (the income-tax, tax on profits), from the tax on turnover and from certain of the indirect taxes. Owing to diminished incomes tax payers tend to fall behind in their payments, and transfers from one account to another become necessary. The most important vocational association "Zemědělska Jednota" (Union of Farmers of Czechoslovakia) has during the past year initiated various policies in the interest of the national economy involving consideration of the lowering the retail prices of all commodities, rents, taxes, etc., so as to renew the consuming capacity of agriculture, as being one of the most important factors in the economic life of Czechoslovakia.

If the pre-war position of incomes, wages, taxes, wholesale and retail prices of every kind of commodity be considered as the result of the natural evolution and of the free play of forces which reacted on the moral and social pre-war conditions, and if it were desired to re-establish this balance of prices and incomes in gold parity of pre-war times, it would be necessary to increase the prices of agricultural products by 10 per cent, while the prices of the requisites of agricultural production must be lowered by a fifth and the prices of the farmer's own requirements by one-fourth. Taking other incomes and prices of additional commodities (see Figure 3) shoes stand at the pre-war index, while for food stuffs prices must be reduced by 7.5

per cent., for household manufactured products by 24 per cent., clothing by 27 per cent., cotton textiles by 33 per cent., coal and coke by 44 per cent., wages at Prague by 25 per cent. and taxes by 48 per cent.

Since pre-war times considerable changes have been brought about by technical and social development in the distribution among individual participants of incomes resulting from national production. None the less comparison with the normal pre-war conditions is always a most useful means of adjustment of ideas, although not absolutely exact. Prices cannot be lowered without serious interference with the interests of private persons and groups. At the same time the necessity will arise for a considerable number of people to change their way of life and generally to correct their judgment on what is or is not indispensable in consumption, or on what represents a standard of life appropriate to the economic conditions or belonging to the class of ideas which have grown up since the war, the distinguishing note of which is the ardent desire to enjoy all forms of luxury and everything life can offer.

The private person, as well as whole groups or the nation as a whole, will be obliged to adapt consumption to income. National income is merely the result of the production and of the economic position of the whole State. The Czechoslovak worker cannot compare his wages with those of the English or American worker, nor can the Czech farmer compare his income with that of the Danish farmer, nor the hired worker his remuneration with that of the State employees in Western Europe, without taking Czech conditions of production into account.

Natural development will always make it impossible for one class of the population to live at the expense of another class, for the economic system of a country is a complex of interdependent elements. Proof of this is seen in the effects which the consequences of the crisis in agriculture have on the spheres of industry and trade, as well as in the resulting check on development of all economic life.

It is of course obvious that every one protects himself against the forces of devaluation from the moment that they impinge upon him. The farmer however had not lowered prices of his own will.

It is certain that no group can escape this evolution, in the natural course of which the situation will adjust itself; it is merely a question of the time taken.

Where the process of devaluation is rendered more rapid, economic life will undergo a new birth, its stabilisation will follow immediately, new trade channels will open at home and abroad, and it will be possible to hope for a return of general well being.

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Effects of the Agricultural Crisis on Peasant Farms in Rumania.

The peasant farms of Rumania provide an immense and varied material for study alike for the careful enquirer into the agricultural crisis as for the sociologist who desires to gain a more complete understanding of the mechanism of rural life.

Probably in no other European country is there to be found so great a variety of peasant, or family, farms, such wide differences in social conditions and so many traces of forms of economic life which once were found in other countries.

Although the Rumanian peasant farmer is the same in all the provinces of the country, and although the type found in the Apuseni mountains of Transylvania

does not differ from that of Southern Bessarabia, yet in organisation of farms, in their equipment and in the farming technique employed, differences are found mainly due to the differing social conditions under which these farms were previously worked.

From the farms in the south of Bessarabia, situated in a dry climate with a rainfall of from 200-300 mm., and from those of the Dobruja on which cereal cultivation has been carried on from very early times, to the farms of the Old Kingdom, and these of Banat, Transylvania and Bukovina, where intensive cultivation is practised, a whole gamut of peasant farms is found differing from one region to another, and difficult to describe fully within the limits of the present article. It will be sufficient here to give a brief account of these farms and to illustrate the influence of the crisis on them.

THE NEW AGRARIAN STRUCTURE OF RUMANIA.

A clear understanding of the present position of the farms of Rumania depends on a recognition of the fact that most of them are of recent date and that from being in 1916 a country of large estates, Rumania has become in the space of a few years a country of small holdings.

It is obvious that the radical change in the agrarian structure has powerfully affected the organisation of farms in Rumania. Herein lies the mistake made by those who have judged Rumanian agriculture during the first post-war years by the number of truck-loads of exported cereals, instead of taking into account the immense social effort achieved by the country in effecting within so short a time so fundamental a transformation in agriculture.

The observations that follow may form a basis for discussion alike for foreign economists and for those of Rumania who, although the small holding system was caught by the crisis before it was fully constituted, are inclined to attack it and the agrarian reform to which it owes its existence.

The fact is that while the agrarian structure of Rumania has changed, the former attitude of mind and standard of judging of the return of Rumanian farming has not undergone modification. The majority of the studies published on Rumanian agriculture are confined to statements of the pre-war situation and comparison of it with that of the post-war period, with estimation of the value of Rumanian exports in 1914 and in the last few years.

There is however nothing to prevent the view being advanced that within the space of a few years Rumania might cease to export some part of the principal commodities previously exported and yet become a country with an intensive and scientifically managed agriculture.

In spite of all the criticism which has been for some time past levelled at small ownership in Rumania, it is the opinion of the writer that the system, now in course of organisation, will result in the near future in a large gross return, higher than that formerly given by the large estate on the same area. With the object of verifying this assertion, the Rural Economy Section of the Rumanian Institute of Scientific Agricultural Researches has for some time been collecting data which will form the subject of a work of some length. The studies published so far, in relation to the return from Rumanian agriculture, are unsuccessful on account of the method applied. In forming an estimate of this return all that is taken into account is the area under cultivation and the average crop, which is of course lower in the case of the small holding. At the same time, the results of this method are wide of the mark

since it ignores the fact that on the small holding the average crop does not represent the gross return, that the peasant farm makes admirable use of all residues and that on it is found the bulk of the livestock capital of Rumania, representing an important part of the national wealth. The peasant family is also left out of count. Rumania at the present time has 15 million peasants out of a total of 18 million inhabitants and the agrarian reform, in spite of all the criticisms it has undergone, has secured to the peasant family the possibility of better nourishment under better conditions. It is to this point that Rumanian theorists should direct their attention, so as to ascertain the facts in regard to the post-war standard of living of the Rumanian peasant and of the reason why Rumanian agriculture places less of its products on the market. This is a general summary of the situation which is the result of small ownership and of the too hasty criticism which has been levelled at the system.

THE INFLUENCE OF THE CRISIS.

In regard to the effects of the crisis in Rumania, it so should first be explained that apart from large and medium-sized holdings, peasant farms are divided into the following large groups :

- (a) peasant farms of the plain, situated in Muntenia, Oltenia, Moldavia, Bessarabia and the Dobruja, and growing cereals exclusively ;
- (b) peasant farms of the hill regions, growing vines and fruit trees ;
- (c) peasant farms of Banat, Transylvania and Bukovina growing crops on an intensive system and engaged in stock farming for profit ;
- (d) mountain farms.

The large farm, organised in the Old Kingdom with a view especially to the production and sale of cereals (wheat, maize, barley and oats), has been severely hit by the crisis. While prices of cereals have fallen in an extraordinary way, prices of labour, of industrial products, taxes, export duties, transport rates, etc. have remained up to the spring of this year at the former level.

The large farms of Transylvania which are mainly engaged in breeding and marketing of live stock and live stock products, have been less affected by the crisis ; live stock prices, especially in Transylvania, remained up to the autumn of 1930 at a satisfactory level and the fall has not been so abrupt as that which took place in cereal prices.

In the case of the small or peasant farms, the crisis has been felt according to the extent to which the farm was dependent on paid labour and on the market, and according to the cropping system followed.

Thus the peasant farming of the Old Kingdom has a semi-family character and a cropping system which is exclusively cereal. The capitalist farm undertakings are found only in the neighbourhood of the large centres. The production of the greater number of the peasant holdings of the Old Kingdom is in the first instance for the family requirements. Relations with the market are due rather to the obligations imposed on the farmer by the State than to the immediate needs of the family, since the main requirements in food and clothing are covered by the products of the farm itself. The post-war years when cereal prices were good (8 lei per kg. of wheat and 6 lei for other cereals) were very favourable to peasant families. This is the explanation of the great progress which took place in the country districts over a certain period in regard to luxury, clothing in the town style, the desire to send the children to school, etc. Subsequently however owing to the crisis the

ambitions of the peasant, always modest, have greatly shrunk. The peasant farm of Rumania has endeavoured to adapt itself to this crisis. The peasant family has still further reduced its relations with the market; clothing has been simplified, the dietary is now based solely on the products of the farm, and money is no longer invested in the farms.

There can be little doubt that the low price of cereals has not greatly affected — from the point of view of the farm book-keeping — the income of the peasant farms. Side by side with the decrease in the value of the gross return, expenditure has been reduced and since on the majority of Rumanian peasant farms the labour is mainly the contribution of the family, the farming income has become adapted to the crisis. It is however only from the standpoint of accountancy that the situation is in any way satisfactory; viewed in its actuality it is more painful. The greater number of peasant farms exhaust themselves in the endeavour to pay debts contracted in the course of the years of apparent plenty, so that any small profit gained has to go towards the payment of interest. It might be urged that the fact that the majority of the peasant farms have debts at the present time is a proof of close relations with the markets, and that in consequence these farms have a capitalist character. Most of these debts however are not debts of investment, but were contracted for consumption or for purchase of land. The peasant who gained independence as the result of the agrarian reform proceeded to certain unproductive expenditure. *Now he is recalled to reality by the crisis.* Although the Rumanian peasant possesses an immense power of adaptation to economic difficulties, the depression of the prices of agricultural products makes it impossible for him to pay even the interest on debts incurred during the period 1923-29.

From the latter year onwards the debts have increased automatically owing to the fact that interest payments have not been made at the due dates. Undoubtedly it is for this reason that the effects of the crisis have been so far-reaching. In order to meet this liabilities, the peasant farmer has abstained from introducing any kind of improved methods into his farming procedure. If the farm produced at the present time at least 200 kg. of cereals more per hectare, the situation might improve, especially as an increase in production could be easily obtained with the existing farm stock merely by means of the application of a more scientific method of cultivating the soil. So as to meet the obligations contracted in the past, the Rumanian peasant continues to reduce his standard of living. But the reduction or stagnation in the consumption of town and industrial products seriously endangers the position of trade and industry. As an example there may be taken the agricultural industry of sugar manufacture. The Rumanian peasant was not a great consumer of sugar, and now this consumption is still more reduced, with the result that the sugar factories have been obliged noticeably to reduce the area under sugar beet.

In the Banat, Transylvania and Bukovina, the crisis has had less effect on these farms of the plain than in the Old Kingdom and in Bessarabia, as there is more mixed farming, and owing to the prevalence of stock farming it is possible to turn to advantage the greater part of the agricultural products. In addition prices of animal products have fallen less than those of cereals. Taking as basis the year 1912 = 100, the price movements of the following cereals and animal products, f. o. b., are shown by the indices as follows :

	1928	1929	1930			
			I	II	III	IV
Oxen	5224	5385	5336	4226	3720	3413
Cows	6533	7288	6798	5766	5066	4955
Pigs	8861	8396	6116	6600	5300	5060
Eggs	5809	5659	4898	4239	3965	3827
Wheat	4877	4176	3358	3117	2716	1872
Maize.	5668	3761	2867	2645	2470	1812
Barley	4391	3156	2426	1920	1458	1440

It will be seen that at the end of 1930 the prices of cereals were lower as compared with those of animal products. In consequence grassland farms and those with mixed farming have undoubtedly done better in regard to returns, although in this year 1931 the effects of the crisis are being felt still more widely and even in the sphere of animal production.

The fall in the prices of cereals has been of considerable advantage as regards the feeding of the populations of the hilly and mountainous regions. On the other hand, the price of horticultural products has remained up to 1931 at a more favourable level. The position of vine-growers and fruit-growers has been perceptibly improved by the reduction of manufacture of alcohol from cereals, a problem which has aroused much public discussion in the course of the last few years. The prospects for the trade in wine in 1931 are not favourable. It must not be forgotten that a much more intensive farming is required for vine cultivation, and that returns are much affected by the heavy labour requirements.

In Transylvania, as in the hilly and mountainous regions, the crisis has been in the same way aggravated by the existence of debts. The latest enquiry undertaken by the Section of Rural Economy of the Rumanian Institute of Agricultural Research in relation to 60,000 farms shows that the indebtedness is as follows per hectare :

1. Transylvania	4,833 lei
2. Bessarabia	1,117 "
3. Moldavia	3,218 "
4. Bukovina	11,024 "
5. Dobrudja	3,933 "
6. Muntenia	3,513 "
7. Oltenia	6,061 "
Rumania	3,218 lei

For an average indebtedness of 3500 lei per hectare, the interest amounts to 700 lei per hectare. This sum is a serious burden on peasant farms the average

gross income of which is 2000 lei per hectare. It would thus appear that 35 per cent. of the gross income is absorbed by the interest, but in 1928 however the gross income per hectare was from 6000 to 7000 lei, and the interest charges thus represented from 10 to 11 per cent. It is in the play of these figures that there lies the whole effect of the present crisis on the peasant farms of Rumania.

Immediately after the agrarian reform, the peasant farm was absorbed into the market system and at the moment when this type of farming was beginning to assume a certain solidity the crisis occurred. Apart from these obligations previously contracted the peasant farms could easily and quickly adapt themselves to the crisis. Considerable efforts have been and still are being made by the State to raise the level of the returns of peasant farming with a view to solving the problem of agricultural debts.

From the enquiry made and from personal contact with the farmers it appears that it is not the fall in the prices of cereals which is their main anxiety, but the fact that while these prices fall, the standard of living is lowered only with difficulty.

If the Rumanian State achieves the realisation of the plan established by it in view of the remedying of agricultural indebtedness, it is certain that, in spite of the world crisis, the peasant farms will recover their power of adaptation and production. This great army of workers will be in a position to toil with profit, and in Rumania as in other countries, at this stage in the development of agriculture, it will be clear that small ownership and the peasant farming class still remain the economic and social basis of the national life.

Dr. NICOLAS CORNATZEANU

PART II.

Some Results of the Comparative Statistical Study of Farm Accountancy Data in Certain Countries for 1927-28) (*continued*).

THE POSITIVE CONTRIBUTION OF THE FIRST "RECUEIL,"

(a) *General.*

In the study of the results that, in spite of difficulties in compilation, it has been possible to obtain, the countries will in the first instance be treated in order. An attempt will then be made to calculate and to compare the general averages for each country, all the data being grouped according to country and in serial order. So as to render the tables more illuminating, groups will be established according to the amount of the gross return, between 600 and 650 francs, between 650 and 700 francs per hectare and so on. This will show which farms have given the highest and which the lowest returns. The study of the gross return and of the farming expenses will lead on to the study of the net return which is the margin between the two, as well as to that of the profit or loss on the total farm assets, that of the social income and that of the family labour earnings.

(b) *The Gross Return and the Farming Expenses.*

By *gross return* is meant the total increase in value obtained in one year through transformation, exchange and revaluation, and by *farming expenses* is meant

the total amount of the labour costs, including a fair wage claim for the labour of the members of the farm family, cash payments for current expenses and contributions in kind from the farmer towards farm expenses, including also taxes, decrease in supplies and in unexhausted cultivation values, and depreciation charges. By adding to the figure thus obtained the interest on capital engaged, the *cost of production* is obtained.

On Table V it may be noted that the farming expenses follow the same ascending course as the gross return. The farms on which the gross return is highest are also those that have engaged in most expense to obtain it, and the variations in the expenditure are correlated with those in the intensity of the farming. This tendency appears in each of the countries under consideration.

In England, the gross return and the farming expenses of the mixed farms, in Yorkshire, for which data have been supplied by the Leeds office, are double those of the grass producing farms of the same region, and the farms growing field crops show a gross return of about 80 gold francs per hectare higher than that of the mixed farms. Taking the totals only, it is surprising to note that the gross return of the eight Newport farms is double the average gross return of the Yorkshire farms. This difference is due to the fact that on the farms of the Newport area, cattle farming, the predominant branch of farming in both regions, is more intensively carried on. The gross return from the breeding and the sale of slaughter stock of the Newport farms amounts to 375.93 gold francs per hectare, while that of the Leeds farms is only 61.07 gold francs per hectare. The following groups of expenditures are equally significant.

Expenditure on stockfeeds	Newport.	219.73 fr. per ha		
»	»	Leeds	116.77	» » »
Taxes	Newport.	116.49	»	» »
»	»	Leeds	14.19	» » »

In addition the Newport farms produced potatoes to the value of 25.86 gold francs per hectare, and sugarbeet to that of 54.86, while these crops were not grown on the Leeds farms. At Newport the farming expenses amount to 70 per cent. of the gross return, and at Leeds to 82 per cent.

The same tendency is observed in the Netherlands. Gross return and farming expenses are higher on the mixed farms than on the grazing farms, and higher still on the dairy farms in the sandy areas.

In order to give a clearer idea of the tendencies appearing on the farms of the different regions of Germany, the farms will be entered on graphs (see pp. 218-219) and the influence will thus be more clearly shown of the system of farming and of the region on the amount of the gross return and on the farming expenses.

Continued; TABLE V. — Gross Return and Farming Expenses in gold francs per hectare for 1927-28.

Country	Classes (gold francs per ha.)	Farming systems	Region	Number of farms	Aver. area per ha.	Gross return per ha.	Farming expenses per ha.	Net return	Percentage of net return
Hungary:	(continued) 200 to 300	growing cereals (medium)	Transylvania	11	410.11	204.80	104.15	90.65	22.6
		" (large)	"	25	307.15	220.70	108.15	80.55	11.6
		" (medium)	Great Plain	10	411.51	220.80	105.15	80.65	1.6
		" (large)	"	18	1094.25	225.15	225.15	50	1.6
		"	South	10	1657.14	371.70	30.35	81.75	111.6
Rumania:	300 to 400	mixed, heavily forested	South	30	50.20	10.66	11.75	45.85	1.6
		growing cereals	Bessarabia	40	9.40	215.81	140.40	60.75	3.6
		"	Bucarest	3	7.90	5.77	302.10	56.25	2.6
Sweden:	400 to 500	mixed (cereals with some sugar beet)	Central III	10	31.90	340.76	190.35	100.80	7.6
		grain prod. with some rye and barley	Upper Norland	57	14.10	475.00	110.05	87.10	2.6
		mixed (cereals with some sugar beet)	Central II	16	15	475.00	418.85	84	6.6
		grain prod. with some barley and rye	Lower Norland	21	13.45	181.50	300.00	95.05	4.6
		grain prod. with some barley and rye	Upper Norland I	75	7.80	500.05	462	9.20	1.6
		growing cereals with some sugarbeet	Central V	67	23.50	506.50	481.25	95.60	1.6
		grain prod. with some rye and barley	Lower Norland	24	6.90	501.10	540.15	80.05	1.6
		growing sugarbeet with some cereals	South V	18	23.10	411.15	508.45	91.50	5.6
		growing cereals with some sugarbeet	Central IV	11	78.82	652.50	620.60	95.10	2.6
		mixed (cereals with some sugarbeet)	Central I	54	6.77	655.10	577.30	88.10	5.6
Finland:	300 to 350	various types of cattle farming	Ostrobotnia	57	18.70	110	255.80	52.50	5.6
		various types of cattle farming	South	66	56.44	125.40	274.25	84.15	1.6
		various types of cattle farming	Ostrobotnia	5	71.11	125.40	280.05	80.05	1.6
		various types of cattle farming	Central	115	17.02	170.25	195.20	195.80	1.6
		various types of cattle farming	South	162	12.51	120.05	172	97.40	2.6
Denmark:	400 to 450	various types of cattle farming	South-East	51	17.00	111.40	950.05	81.15	2.6
		various types of cattle farming	South-West	20	11.81	4.57	980.50	83.75	1.6
		all farms more than 100 ha.	All parts	50	210.00	698.00	612.50	93.55	2.6
		" fr. 50 to 100 ha.	"	91	67.10	780.60	716.00	93.80	1.6
		" fr. 30 to 50 ha.	"	183	38.10	904.75	856.20	91.05	4.6
Switzerland:	1000 to 1200	" from 20 to 30 ha.	"	401	26	1018.56	946.40	92.80	3.6
		" fr. 10 to 20 ha.	"	100	16.50	1108.20	1031.50	93.70	2.6
		below 10 ha.	"	141	5.80	1088.35	1615.25	95.95	1.6
		all farms	All parts	12	60.40	976.05	822.60	94.20	1.6
		" (30 to 100 ha.)	"	121	20.10	1115.00	951.15	85.55	1.6
Poland:	100 to 200	" (5 to 10 ha.)	"	115	12.60	1160.40	1040.50	87.30	1.6
		" (5 to 10 ha.)	"	182	7.05	1265.05	1165.05	92.85	1.6
		" (below 5 ha.)	"	48	3.70	1632	1522.05	95.15	1.6
		all farms	South	135	10.51	1775.80	1510.75	68.05	2.6
		"	Central	255	8.80	181.00	262.50	66.20	1.6
Latvia:	100 to 200	"	Central	203	13.83	983.05	246.05	64.25	3.6
		"	West	121	18.05	423.05	270.75	65.85	4.6
		all farms	All parts	117	45.57	156.11	137.55	48.11	1.6
		all farms	"	260	11.81	108.15	189.70	88.13	1.6
		all farms	"	100	17.20	952.30	802.15	90.55	1.6
Estonia:	100 to 200	all farms	"	12	60.40	976.05	822.60	94.20	1.6
		" (30 to 100 ha.)	"	121	20.10	1115.00	951.15	85.55	1.6
		" (5 to 10 ha.)	"	115	12.60	1160.40	1040.50	87.30	1.6
		" (5 to 10 ha.)	"	182	7.05	1265.05	1165.05	92.85	1.6
		" (below 5 ha.)	"	48	3.70	1632	1522.05	95.15	1.6
Norway:	1000 to 1200	all farms	All parts	117	45.57	156.11	137.55	48.11	1.6
		all farms	"	260	11.81	108.15	189.70	88.13	1.6
		all farms	"	100	17.20	952.30	802.15	90.55	1.6
		all farms	"	12	60.40	976.05	822.60	94.20	1.6
		" (30 to 100 ha.)	"	121	20.10	1115.00	951.15	85.55	1.6

2. Countries which have not indicated the farming systems.

Switzerland:

Latvia:

Estonia:

Norway:

100 to 200

200 to 400

400 to 500

500 to 600

600 to 700

700 to 800

800 to 900

900 to 1000

1000 to 1100

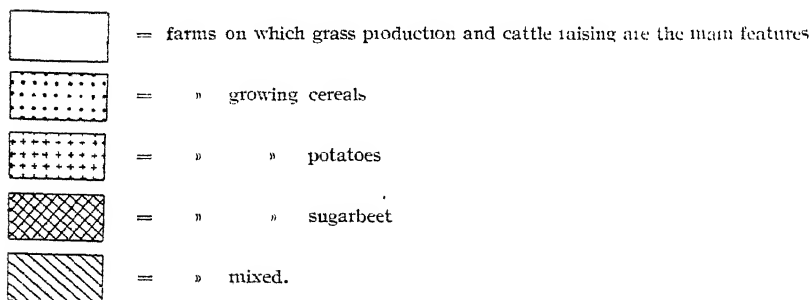
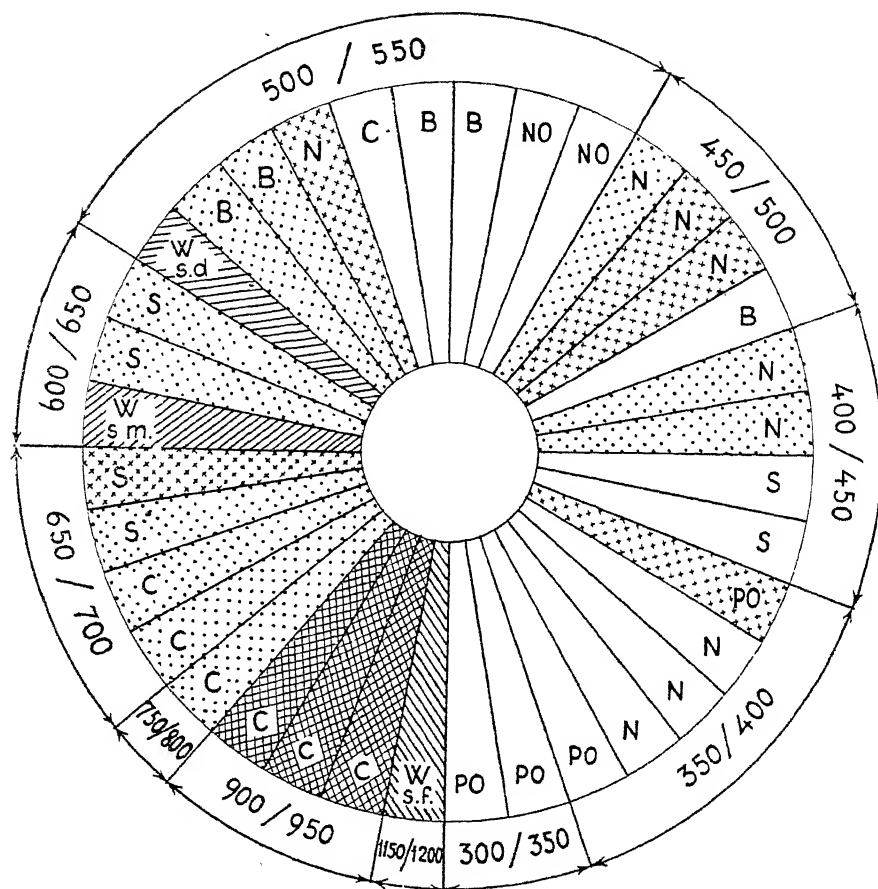
1100 to 1200

1200 to 1300

1300 to 1400

1400 to 1500

GRAPH I. — *Gross return per hectare of 36 German farm by size classes of gross return rising by 50.*

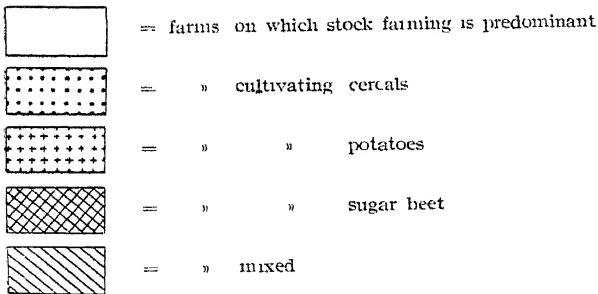
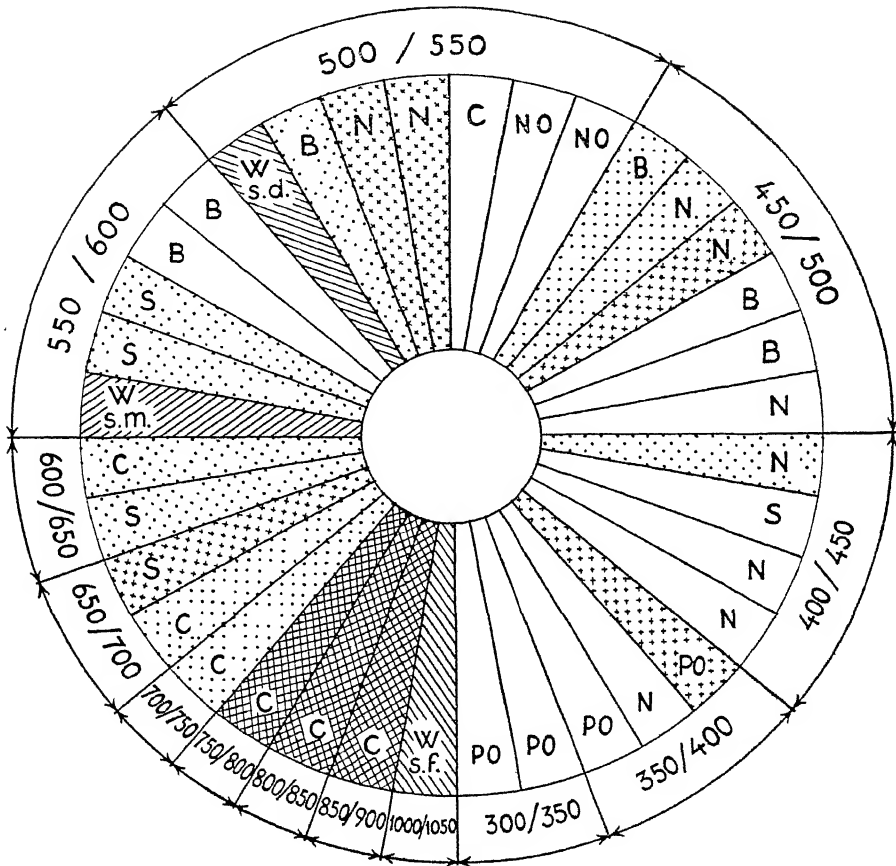


P. O. = Eastern Prussia
 N. = North
 B. = Bavaria
 S. = Silesia
 N. O. = North West

W. s. d. = Wurttemberg unfavourable situation
 W. s. m. = " medium "
 W. s. f. = " favourable "
 C. = Centre.

N. B. — In the Sector 400/450 instead of S. S. N. N., read B. S. N. N.

GRAPH II. — *Farming expenses of 36 German farms by size classes of the amount of the farming expenses rising by 50.*



P. O. = Eastern Prussia.
 N. = North
 N. O. = North West
 W. s. d. = Württemberg, unfavourable situation
 W. s. m. = " medium "

W. s. f. = Württemberg favourable situation
 B. = Bavaria
 S. = Silesia
 C. = Centre.

The two preceding diagrams may be combined and expressed as follows.

Farms	Farming expenses	Region	Gross Return	Region
A				
On which grass incl. forage production and stockfarming are predominant	the lower ranges	Eastern Prussia, North Silesia, Bavaria.	the lower ranges	Eastern Prussia, North, Silesia, Bavaria
Growing cereals	—	North Bavaria	—	North
Growing potatoes	—	—	—	Eastern Prussia, North
B				
On which grass incl. forage production and stock farming are predominant	medium ranges	North-West, Centre, Bavaria	medium ranges	North-west, Centre, Bavaria
Growing potatoes	—	North	—	North
Growing cereals	—	Bavaria, Silesia	—	Bavaria, Silesia
Mixed	—	Württemberg (unfavourable and medium situation)	—	Württemberg (unfavourable and medium situation).
C				
Growing potatoes	the higher ranges	Silesia	the higher ranges	Silesia
Growing cereals	—	Silesia Centre	—	Silesia Centre
Growing sugarbeet	—	Centre	—	Centre
Mixed	—	Württemberg favourable situation	—	Württemberg (favourable situation).

In Austria, the gross return and the farming expenses follows the same regular ascending curve as the degree of intensity of the farming. Farms on which forest land predominates, and alp pasture land farms, both of an extensive character, have only small expenses and the gross returns are very low: grass producing farms with or without alpine pasture and better situated obtained a gross return double that of the preceding types; the highest gross returns (three times that of the grassland farms with or without alpine pasture and five times that of the farms where forest land predominates and of the alp pasture land farms) have been obtained from vine growing farms of an essentially intensive character.

There is little difference between the results of the farms of the four regions of Hungary where conditions differ little from one region to another; the farms of Hungary as a whole are characterised by the cultivation of wheat. The percentages of the distribution of cultivated lands are as follows (see *Recueil* p.) :

	Fields	Meadows	Pasture lands	Vineyards	Gardens	Total
Peasant farms	84.20	7.74	5.11	2.23	0.72	100—
Medium-sized farms	83.01	4.54	10.02	1.43	1.00	100—
Large farms	72.67	7.30	19—	0.56	0.47	100—

Percentages of the arable area

	Cereals and root crops	Industrial crops	Forage crops	Fallow	Total
Peasant farms	82.40	1.51	13.14	2.95	100—
Medium-sized farms	75.31	6.10	18.19	0.40	100—
Large farms	72.71	5.10	20.75	1.44	100—

By regions the percentage of the arable area is as follows :

Region	Cereals and root crops	Industrial crops	Forage crops	Fallow	Total
Great Plain					
peasant farm	84.70	1.71	10 —	3.59	100
medium-sized farm	75.19	8.45	18.36	—	100
large farms	76.24	7.27	14.70	1.79	100
Transdanubia					
peasant farm	83.31	0.23	15.42	1.04	100
medium-sized farm	75.13	4.00	19.96	0.82	100
large farms	69.75	2.84	26.67	0.74	100
North					
peasant farm	76.61	2.87	16.13	4.39	100
medium-sized farm	75.93	4.24	19.25	0.58	100
large farms	71.87	5.91	19.64	2.58	100

The large farms keep more land under pasture and in forage crops than do the small farms ; they undertake breeding of pigs and sheep as shown by the following figures :

	Head of livestock per hectare			
	Horses and work oxen	Dairy cows	Pigs	Sheep
Peasant farms	2.52	—	—	—
Medium-sized farms	1.48	0.94	4.36	4.66
Large farms	1.35	0.75	4.29	8.93

The large farms appear to be more many-sided and complex but not so much so however as to make them essentially different.

The farms in the immediate neighbourhood of Bucarest are not sufficiently numerous to be representative and hence the results relating to Rumania can only be mentioned here with reservations, but seem none the less to be very significant. The striking fact is the low percentage which expresses the relation of the farming expenses to the gross return. This percentage which in other countries is not far from 100, in Rumania does not exceed 60. The following comparative figures in gold francs per hectare indicate the same tendency :

With all due reserve certain analogies may be drawn from these figures with the conditions described by Thünen when he formulated his theory of the "isolated State". It may be admitted that Bucarest is the most important centre on which converge all the lines of communication. The distant farms have few or no horses and the capital does not seem to serve as a market for their products: farms situated in the immediate neighbourhood of this centre have considerable expenses in connection with transport by their own carts, etc., of the milk supplied and even of certain vegetables and tobacco.

As regards Finland and Sweden, no specially marked tendencies appear from the study of the results of the farm types and regions shown in Table V. But passing on to Denmark there is a striking influence exercised by the size of the farms on the results. The gross return and the farming expenses increase as the average area decreases, and the same is the case with Switzerland.

The numerous characteristics of Polish agriculture cannot find full expression in a limited table which does not contain enough data and in which the large farms are not shown. It is however possible, as for other countries, to throw light upon the general tendencies. "It may with justice be said", as quote a paragraph from the article in this *Review* entitled "Enquiry into the Economic Conditions and the Profit Capacity of the Peasant Farms in Poland" (1) that the figures in Table V "would appear quite other if Polish agriculture had been able to develop in the economic and social conditions, and under the legislation, of a single State. For example, the difference between the degree of productivity of the departments of the West and the East would be the other way; the results of the agriculture of this latter region, which has an excellent soil, remain far below the level of those of the West where agriculture has been able to reach a much higher level, in spite of less favourable natural conditions".

(c) *General Averages of Gross Returns and Farming Expenses*
in gold francs per ha.

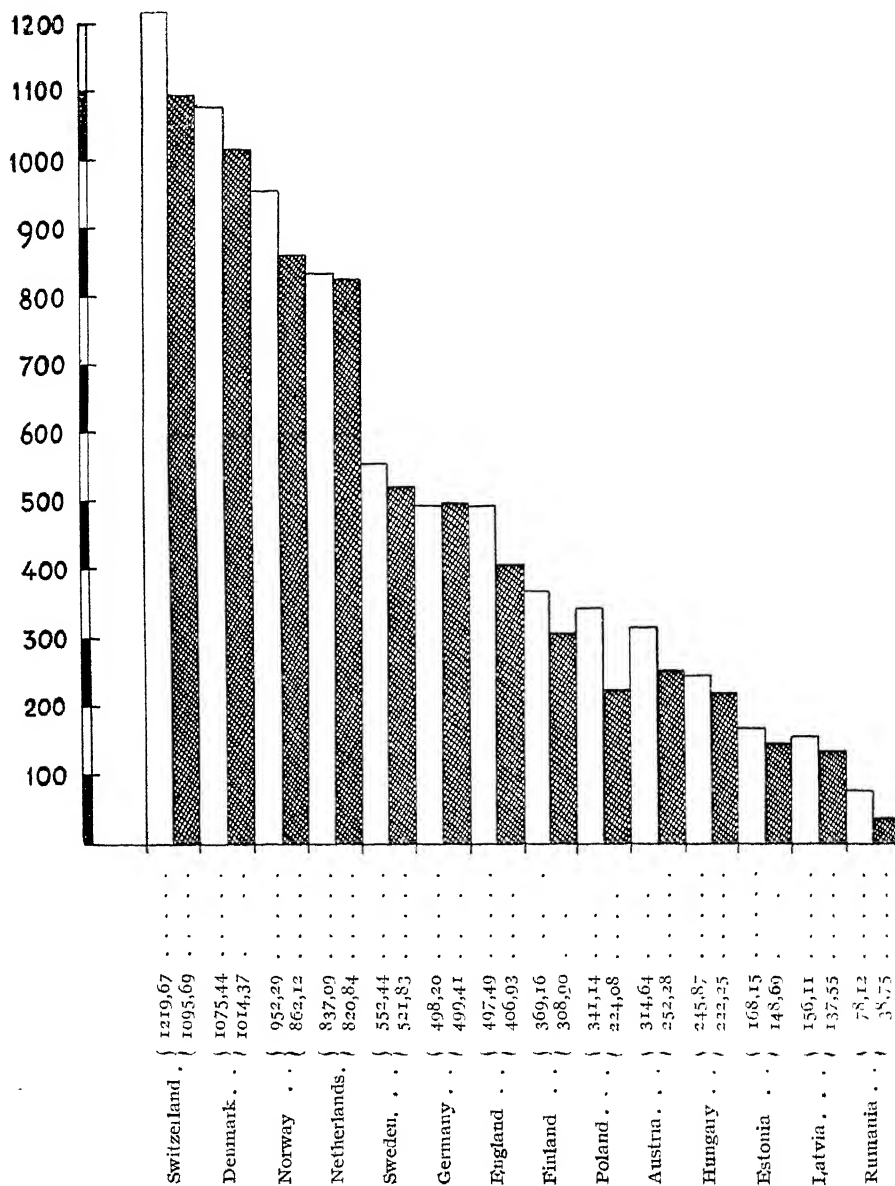
The weighted averages calculated of the results of the countries so far reviewed, are shown by means of Graph III:

Apart from certain modifications due to special conditions, the position occupied by each country in this diagram will be fairly closely maintained, the countries of Western Europe coming first with more favourable results while those of the East give less favourable results, except for Czechoslovakia where the earning capacity is among the highest. Switzerland stands at the head with a gross return of some 140 gold francs higher than that of Denmark. To attain the same results, Denmark would have to engage in higher labour costs and farming expenses than would be required in Switzerland. In Germany the earning capacity is still more unfavourable: the gross return is not enough to cover farming expenses. Norway is one of the countries with most intensive farming and the earning capacity is one of the best. As regards the Netherlands reference should be made to the reserves formulated (see p. 169 of *Review*, June 1931) in Part I of this article in which gross return and farming expenses of the most important farming systems in certain countries were compared. The averages however show that an intensive cultivation characterises the farms of the Netherlands, but that the level of the farming expenses nearly attains that of the gross return. Average gross returns have been obtained by Sweden, Germany and England; after that gross return and farming expenses diminish rapidly in the following order: Finland, Poland, Austria, Hungary,

(1) Cf. *International Review of Agriculture*, Part II. May 1929.

GRAPH III. — *Gross Return (in white) and Farming Expenses (in black)*
in gold francs per ha.

General averages for each country for 1927-28



Estonia, Latvia and Rumania where they fall to 80 and 40 gold francs per ha. respectively.

The two following tables, based on figures taken from the *International Year-book of Agricultural Statistics* also reflect the tendencies shown in the diagram of gross return :

TABLE VI. — *Production per ha. (1) in quintals.*

Country	Wheat	Rye	Barley	Oats	Other cereals	Potatoes	Sugar beet	Feeder beet	Lucerne	Clover	Mixtures	Natural meadows
Switzerland . .	218	20.3	18.8	20.4	—	142.5	303.0	—	—	—	—	—
Denmark	21.3	14.4	23.6	21.6	—	78.7	268.4	505.7	—	—	—	37.54
Norway	16.6	16.5	16.8	18.9	—	121.2	—	—	—	—	45.67	23.15
Sweden	19—	13.9	16.2	15.7	—	67.7	243.8	268.90	—	—	41.30	13.60
Germany	18.8	14.5	17.9	18.3	—	133.4	250.0	344.69	63.01	53.38	—	43.11
Finland	10.2	14.3	13.2	14.1	—	107.5	155.0	—	—	—	31.07	10.97
Poland	12.2	16.2	11.4	10.8	—	109.7	209.3	198—	—	—	—	—
Austria	15.9	13.3	16.1	14.1	—	145.5	295.7	311.48	38.22	56.31	—	37.08
Hungary	12.9	8.9	12.7	12.6	16.3	73.4	214.0	243.39	36.57	31.89	—	—
Estonia	10.9	11.5	7.9	6.7	—	104—	—	170.30	—	—	26.90	—
Latvia	12.2	10.1	7—	5.8	—	83.9	—	—	—	—	30.81	16.24
Rumania	8.5	8.4	7.2	8.0 (2)	8.4	123.3	184.7	144.08	30.31	25.52	—	16.64

(1) The figures are taken from the International Year-book of Agricultural Statistics. — (2) *Man/c.*

TABLE VII — *Cultivable Area in percentages in 1927/1928*

Country	Wheat	Rye	Barley	Oats	Other cereals	Total cereals	Potatoes	Sugar beet	Other root crops	Total root crops	Industrial crops	Artificial meadows	Fallow etc.	Bare Fallow	Total	Cultivable land in % of land under cultivation	Natural meadows and pastures in % of land cultivated	Gardens	Cultivated lands
Switzerland	10.18	3.92	1.28	4.04	4.02	23.44	9.46	0.32	2.65	12.43	0.01	64.12	—	—	100	23.03	76.33	0.64	100
	—	—	—	—	—	30.88	10.96	4.16	—	13.69	0.33	53.70	—	—	100	—	—	—	—
Denmark	4.22	6.98	12.69	15.61	9.81	49.31	2.78	1.61	14.95	19.29	0.11	28.10	1.76	1.44	100	80.21	10.79	—	100
	—	—	—	—	—	44	—	1.60	16.80	13.40	1.80	39.40	—	0.90	100	—	—	—	—
Norway	1.45	1.37	8.88	14.22	0.90	26.91	7.31	—	2.21	9.52	—	63.68	—	0.89	100	72.32 (c)	26.65	1.03	100
	2.70	1.70	8	11.70	0.70	24.20	5.50	—	5	10.50	—	64.60	—	0.70	100	—	—	—	—
Sweden	6.11	7.43	8.29	18.76	6.18	41.77	3.76	1.10	2.85	7.74	0.01	43.22	—	8.26	100	76.25 (10)	19.68	1.07	100
	16.39	—	28.67	28.67	—	45.06	6.26	—	4.20	10.46	—	38.97	—	6.41	100	—	—	—	—
Germany	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	70.35	27.28	2.37	100
Finland	0.83	10.62	5	20.83	0.50	37.78	3.27	0.13	1.57	4.97	0.25	47.53	—	9.45	100	64.27	35.55	0.18	100
	2.26	4.45	6.05	18.04	1.10	31.90	3.90	4.28	—	8.18	0.11	52.48	—	7.33	100	—	—	—	—
Poland	7.43	31.48	6.10	10.82	3	58.33	13.33	1.10	2.04	16.47	0.98	8.53 (2)	15.19	4.23	100	74.20	25.80	—	100
	11.71	28.70	5.79	12.98	5.82	65	13.83	1.38	3.32	18.53	0.77	11.47	—	—	100	—	—	—	—
Austria	10.61	19.90	7.67	16.15	3.60	58.02	9.51	1.27	4.24	15.02	0.49	31.85	—	4.02	100	44.14	53.02	2.84	100
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hungary	29.65	12.13	7.38	4.72	19.57	73.45	4.72	1.17	2.04	8.53	1.02	12.19	0.36	4.45	100	73.39	22.31	4.30	100
	25.03	6.09	6.42	6.32	12.25	456.61	2.02	5.48	8.80	16.30	5.18	20.15	—	1.36	100	—	—	—	—
Estonia	2.63	14.52	11.66	14.23	7.08	50.12	6.97	—	1.34	8.31	3.43	17.83	1.86	18.40	100	36.45	63.55	—	100
	—	—	—	—	—	48.72	5.59	—	1.84	7.43	2.85	27.33	—	13.67	100	—	—	—	—
Latvia	2.55	15.89	10.63	18.44	4.54	52.05	4.74	—	4.72	9.46	3.37	16.43	—	18.69	100	40.85	49.52	0.63	100
	4.50	11.87	8.16	16.51	3.84	44.38	4.41	—	3.49	7.90	1.94	31.42	—	13.36	100	—	—	—	—
Rumania	25.15	2.32	13.72	8.75	33.63	595.57	1.61	0.45	1.82	3.83	2.47	4.85	—	3.23	100	73.20	23.27	3.53	100
	37.41	4.67	7.32	—	38.47	687.37	—	—	—	—	3.35	8.78	—	—	100	—	—	—	—

(1) The first series for each country is taken from the International Yearbook of Agricultural Statistics, the second from the "Recueil de statistique". — (2) Under fallow in Poland are included the crops for green manuring and all grazing on arable land. — (3) Including maize 19.31. — (4) Including maize 9.44 — (5) Including maize 33.09. — (6) Including maize 20.01. — (7) Peasant farms only. (8) The figures for Rumania refer to the year 1928-29. — (9) Apart from pasturelands which are included with the other lands of a total area of 22,564,073 ha. — (10) Apart from pasture lands which are included in the forests of a total area of 24,583,721 ha.

In Tables VI and VII, the countries have been grouped in the same order as in Graph III, with a view to facilitating the comparison of the three tables. In this way are obtained tendencies which are very closely in agreement, and the character of the agriculture in the countries under consideration is well defined. The figures in black type on both tables indicate high yields of important crops.

If a country be taken at random and if the figures for two successive years are compared, it will be noted that the differences are insignificant. The following are, for example, the figures obtained for Sweden :

Percentage of arable area.

	Percentage of arable area			
	taken from the Yearbook		taken from the Recueil	
	1927	1928	1927	1928
Wheat	6.11	6.12		
Rye	7.43	7.43	16.39	16.28
Barley	3.29	2.96		
Oats	18.76	18.68	28.67	27.52
Other cereals	6.18	6.10		
TOTAL CEREALS	41.77	41.29	45.06	43.80
Potatoes	3.76	3.75	6.26	6.23
Sugar beet	1.10	1.15		
Other root crops	2.88	2.82	4.20	4.47
TOTAL ROOT CROPS	7.74	7.72	10.46	10.70
Industrial crops	0.01	0.02	—	—
Artificial grassland	42.22	42.70	38.07	39.14
Fallow and other	8.26	8.27	6.41	6.31
TOTAL	100 —	100 —	100 —	100 —

The very high percentages, in relation to the arable area, of artificial meadows in Switzerland, Norway and Sweden, of fodder beet in Denmark, as well as the high returns obtained per hectare all show the intensive character of the farming on the farms primarily engaged in these countries in dairy production. In Denmark, in Norway and Sweden, barley and oats are largely used in stock feeding. Denmark is the country in which the percentage of cultivable lands is the highest, and in consequence the one in which cultivation is most intensive. The average gross return is only 140 gold francs lower than that of Switzerland which has more complex farm undertakings on which fruit-growing, vine-growing or special branches are successful owing to climatic conditions. The proportionate value of animal production to the total gross return is in Switzerland 65.50 per cent. and in Denmark 86.97 per cent. The proportion of the gross return represented by vine-growing in Switzerland is 2.36 per cent., that by orchard-growing, 7.15 per cent., and by other various branches 14.52 per cent.; in Denmark, vine-growing and orchards contribute nothing to the gross return, and other branches only 5.16 per cent. (See pp. 168 and 169 of the *Recueil*).

In Switzerland, the preponderating subsidiary crop is wheat, in Sweden rye. Like the four countries mentioned above, Finland, Estonia and Latvia also base their rotation system on artificial meadows and like Sweden they grow oats and barley in the second line. But in the scale of returns, Finland is nearly at the level of Sweden, while Latvia and Estonia fall far below. The agriculture of these two latter countries is more extensive, as is shown by the very high proportion reserved for fallow, natural meadows and pasturelands. The per hectare production shown for Austria refers mainly to the regions of Lower Austria, so that if a true comparison

is to be made between it and that of other countries, it is necessary to make a slight correction, taking into account the fact that in the whole of the country the area occupied by the natural grasslands and the pasturelands of the mountainous regions represents more than half of the area of the cultivated land, which explains why, in the scale of gross returns, Austria falls among the lower groups. As to Poland, as the note to Table VII shows, 15 per cent. nearly of the cultivable area serves as pasturage, so that the proportion of natural grasslands and pasturage should be increased in the table by 15 per cent. Hungary is characterised by the production of wheat (30 per cent.) on which the return is not remunerative. On the other hand, the cultivation of maize, although not on a large scale, it is true, gives a return as high as that obtained by Norway, Sweden and Germany for other cereals. Rumania is also characterised by the cultivation of maize and wheat, but it appears from the table of production per hectare that the degree of productivity of the farms is still very low.

In a word, the comparative study of tables VI and VII, by giving a general view of the characteristics of the farms of the countries in question, serves to explain the differences encountered in the average returns that have been established by the help of the data of the *Recueil*. It becomes possible to affirm that, although the number and the total area of the farms, the accounts of which have been dealt with by the Offices, may not be truly representative, the values obtained are the mirror of the situation of the agriculture of each country and are up to a certain point comparable.

It is possible to go a step further. Sufficient proof is given by Table VII of the view advanced here. In it are placed side by side the percentages of cultivable land taken from the *Recueil*, and those supplied by the *International Yearbook of Agricultural Statistics*. The agreement of the results obtained is obvious, and it is already possible to foresee that the dynamic indications resulting from the establishment of international statistics based on the data of farm accountancy are capable of serving as the basis of studies of a practical kind, especially so soon as it will be possible to follow the development over the course of several successive years.

It will not, of course, be practicable to have these statistics ready until at least two years after the entry of the data in the accounting books. Hence they should never be regarded as the sole source of information, but supplemented by other statistical information they will form a basis for forecasts for the current year, and in the sphere of international agrarian policy their value may become considerable.

(continued).

J. DESLARZES

SOCIAL CONDITIONS OF THE AGRICULTURAL CLASSES

Rurbanization.

Rural exodus has long attracted the attention of both students and statesmen, and many expedients have been tried to check the depopulation of the countryside and the disappearance of the peasant class.

Although the problem of rural exodus has lost nothing of its importance, the rapid progress made in recent years in the means of transport and communication, and more particularly the increasing use of the motor car, by bringing town and country nearer together and enabling the population of either to enjoy the advantages of the alternative mode of life, have created in many localities a novel situation and given rise to new problems. This intermingling or fusion over relatively large areas of urban and rural elements, most pronounced in the United States, has become known there as "Rurbanization".

Not all the American students however agree on the possible effects of this phenomenon of action and reaction. One can say that discussions on such effects began the day in which, to indicate such exchanges between town and country, G. C. Galpin first used the word "rurbanization" in his "analysis of migration of population to and from farms" (1). Sorokin and Zimmerman, in their volume "Principles of Rural-Urban Sociology" (2), after stating that the rurbanization process is proved by an enormous increase of the population of cities in the Western world, and that together with this increase there has been a proportionate diminution of the total rural population, arrive at the conclusion that, the urban population having increased at the expense of the rural population, this means that the conditions of urban life have come within the reach of an ever greater mass of the population and that consequently populations have become urbanized to an ever increasing extent. But the same authors add that the much discussed urbanization of the rural world simply means that its mode of life had acquired certain of the characteristics of the urban world, without however the differences existing between the two having been entirely eliminated. Sorokin and Zimmerman further believe that a complete urbanisation of the rural population is impossible, and point out to some serious dangers which would result were not the process of urbanization an indication that rural exodus is on the wane rather than that its curve is still ascending. Among such dangers they indicate the fall in the rural birthrate as a consequence of a propaganda which they would like to see checked by legal measures.

The hot discussions still raging on the effects of "rurbanization" are a clear sign that the phenomenon still manifests itself and is variously judged. H. A. Wallace, editor of "Wallaces' Farmer", holds the opinion that timely measures must be taken to avoid the possibility of a transition from the present system of rural life which has the family group at its basis, to a system of rurbanization which would create overpopulated centres with all the faults of city life. He recalls the situation in England about a century ago, when much suffering was caused by the transition from the manual system to a highly industrialized one. He would spare the rural population of America similar suffering, which would inevitably occur, if the process of rurbanization really reached the point of destroying the typically rural characteristics. The same necessity for timely measures capable of preventing the harm of a transition from rural conditions as a mode of life to a largely industrialized rurality as a consequence of rurbanization, is sustained by Mr. C. L. Gray of the U. S. A. Department of Agriculture. Mr. Carl C. Taylor, of the North Carolina State College, is rather more optimistic. He says that agriculture as a mode of life is undergoing a modification without being "relegated to the past in the sense that there would be no more people living on the fields. Each generation will cultivate the land and will employ in this work the latest scientific and business methods, and each generation will add to its mode of life an ever greater culture, both technical and intellectual. Thus each rural generation will have its new mode of life, just as happens with the urban population. Two "shibboleths" however seem to the writer to be confusing the minds of men who, in America, are interested in the problems of the future of rural life. They are: "no more country life", and "Let us urbanize our rural culture". In the first case, were the principle to be applied, there would result therefrom an exaggeration and an aggravation of the great urban problems: poverty, unemployment, slums, crime, etc. The second "shibboleth" is based on

(1) U. S. A. Depart. of Agriculture, Bureau of Agricultural Economics, Division of Farm population and rural life, Oct. 1927. Washington, D. C. U. S. A.

(2) Cap. XXVII, pagg. 608 segg.

a false notion as to the way in which modifications of culture and mode of life take place. Such modifications are the result of amalgamation and synthesis and not of substitution. Rural life will become urbanized only in the sense that some factors which heretofore have been peculiar to urban life will enter into the mode of living of country people. There is no danger of the country becoming one large city. On the contrary there is reason to think that we shall live to see the time when such vast cities as New York, Philadelphia, Chicago, Detroit will be considered anti-economic. It is these very cities which distinguish themselves by buying as much as they can of rural life under the guide of public parks, golf links and other open spaces while with their week-end outings their dwellers try to enjoy as much as possible the benefits of life in the country. This state of things will continue until every great city becomes, as far as it is possible, a large country place. The automobile, the radio, electrification, etc., will certainly become part of rural life, but life in the country will always remain rural life just the same, even when the country possesses all the advantages which distinguish life in the city.

As may be seen, if there are alarming warnings there are not lacking reassuring arguments also : the latter are more convincing than the former, too, at least as things stand now. In the past the alarm was certainly justified. The sons of peasants and farmers, going to the cities for their education, found it difficult to go back to the farm and rural exodus was a serious phenomenon. To-day the deception of the lure of the cities appears evident to country born people who have become urbanized. The industrial crisis pushes them back to the farms. Reports by the U. S. Department of Agriculture show that farmers who had become industrial workmen in times of industrial prosperity, willingly take any opportunity offered them to resume the calmer but safer life in the fields. The benefits which rural life derives from rurbanization are a permanent acquisition for the farmers because they no longer feel isolated. It may well be that in this change of rural environment will be found, at least in certain localities, a solution of the vexed problem of rural exodus.

V. F.

BIBLIOGRAPHY ON ECONOMIC AND SOCIAL QUESTIONS

BUCK John Lossing Chinese farm economy. A study of 2866 farms in seventeen localities and seven provinces in China. The University of Chicago Press, Chicago. 1930. Pp. XII + 476.

[This volume contains the results of a survey of 2866 farms in North and East Central China made by the Department of Agricultural Economics, Farm Management and Rural Sociology of the University of Nanking. The figures collected were not taken from written records but were obtained by investigators direct from the farmers, who are usually able to remember quite clearly the details of the previous year's business. Precise accuracy is not claimed for the original data, but they are believed to be sufficiently accurate to allow of the correct interpretation of the essential characteristics of the farm business.

Farms in North and East Central China are small. The farms surveyed in North China averaged 2.64 hectares and in East Central China 1.58 hectares. The average amount of labour engaged on the farms was 2.07 "man-equivalents" in North China and 2.55 in East Central China, a "man-equivalent" being equal to the labour of one man for twelve months. Taking the actual work done in growing crops and raising animals and measuring it in "man-work units", (the work of one man for ten hours), it averages only 247.4 on the farms in North China and 306.7 on the farms in East Central China. The average capital investment for all the farms included in the survey is \$ 1769, of which 75.5 per cent. represents land and 14.1 per cent. buildings; livestock only represents 3.7 per cent. and farm equipment 2.6 per cent.

The average farm receipts amount to \$376 per farm for all localities, 70 per cent. of

these being from grain crops. Farm expenses average \$137, including \$64 for family labour, and \$25 for hired labour, these being the largest items. The family income, which is the cash balance after subtracting all cash expenses from all cash receipts and adding any other net cash income, averages \$139; this is the amount of money available as a result of the year's work for all wants other than food, raw materials for clothing, and house rent supplied by the farm. The operator's labour earnings, obtained by subtracting the operator's cash and non-cash expenses from his cash and non-cash receipts and from this deducting the interest charge of eight per cent on the average annual capital investment, show an average of \$87, they are rather more than twice as great for East Central China as for North China. Nearly half of the farmers operating the farms surveyed had some income from other sources than the farms, taking all the farms, the average of such income was \$34.

Besides detailed studies of the year's farm business, the volume contains full discussions of the sizes of farms which give the best results, of the systems of land tenure, of the crops and livestock raised, of farm labour, of the farm family and of its standard of living.

An immense amount of labour and considerable cost have been involved in the making of this survey but they are justified by the light which it throws on the economic and social conditions of the farmers in North and East Central China, about which little has hitherto been known in Western countries and on which accurate information was not available even for the Chinese themselves].

AGRICULTURAL LEGISLATION

Summary of Laws and Regulations.

MEXICO. — Ley de ecredito agrícola para ejidatarios y agricultores en pequeño.— 2 de enero de 1931. "Diario Oficial" Tómo LXIV, n. 20 (24 January 1931).

[This law radically modifies the whole system of agricultural credit in Mexico, abrogating the law of 10 February 1926 (1) and the Decree of 30 August 1928 under which, taken together with the respective regulations, agricultural credit was administered. In the articles of a temporary character annexed to the law will be found the arrangements for the transition from the old to the new system; thus the Federal Government is empowered to issue precise instructions for the winding up of the banks known as *ejidales* supplying credit to the agrarian communities (*ejidos*), and of the special co-operative societies formed by the members of these communities.

As regards the credit system the new law extends the scope of the National Bank of Agricultural Credit, institutes regional banks of Agricultural Credit and authorises the agricultural co-operative societies to act as agricultural credit societies. Further the law, with the object always of promoting agricultural credit, sets up a complete system for collecting the savings deposits of the peasants, creates a chain of agricultural warehouses and contains precise measures for the establishment of a public register for registering documents referring to operations of agricultural credit.

The law is divided into six titles, each divided into various chapters with 198 articles to which are added 10 articles containing regulations for temporary application only.

It is now proposed briefly and as far as the subject allows to examine the contents of the law.

The first Title deals in three chapters with agricultural credit institutions.

Chapter I (articles 1 and 2) contains measures regarding the enlarged scope and the working of the National Bank of Agricultural Credit (*Banco Nacional de Crédito Agrícola*) the sphere of which is considerably extended with the object of organising and increasing the agricultural credit available exclusively for members of agrarian communities (*ejidos*) and small farmers.

The following functions are assigned by the Law to the National Bank of Agricultural Credit:—

- (1) to promote, supervise and control the constitution and working of agricultural co-operative societies;
- (2) to organise, control and supervise regional agricultural credit banks;
- (3) to grant loans for working and improvement, secured on land and real property, to co-operative societies;

(1) See *International Yearbook of Agricultural Legislation*, 17th Year, 1926, page 403.

(4) to subscribe to shares of the regional banks and to carry out with these banks, all operations allowed by the law ;

(5) to organise and carry on operations of agricultural warehousing ;

(6) organise and direct undertakings for the necessary industrial transformation of agricultural products, live stock and forest products belonging to co-operative societies and regional banks ;

(7) to issue bonds, agricultural bank notes and mortgage notes, and to guarantee the issues of regional banks ;

(8) to organise and administer the service of the Peasant's Savings (*Ahorro del Campesino*) ;

(9) to colonise and parcel out lands belonging to the Federal Government, to public bodies or private individuals, provided that the operation is of public utility and is to be carried out with funds of the party concerned ;

(10) to proceed, on the instructions and with the funds of the Federal Government, to the economic organisation of the agrarian communities (*ejidos*) and to the vocational training of the members of such communities ;

(11) to supervise and guarantee the entries to be made in the Public Register of Agricultural Credit ;

(12) to carry on the banking and trading operations connected with its functions.

The share capital of the National Bank of Agricultural Credit is constituted by three series of shares ; Series *A*, subscribed only by the Federal Government and necessarily representing 51 per cent. of the members' capital ; Series *B*, which may be subscribed only by local Governments, and Series *C*, which may be subscribed by the agricultural co-operative societies, regional banks and by individuals.

Chapter II (arts. 3-22) deals with the regional Banks of Agricultural Credit (*Bancos Regionales de Crédito Agrícola*). These are organised under the form of limited liability companies for the purpose of :—

(1) promoting the formation of agricultural co-operative societies within the respective area of each bank ;

(2) granting credits to agricultural co-operative societies within their administrative area ;

(3) setting up commercial and industrial organisations to facilitate the sale and utilisation of the products of the associated co-operative societies ;

(4) making arrangements for the establishment of warehouses ;

(5) organising and executing schemes for agricultural technical training and organisation ;

(6) to co-operate with the National Bank for the application of the present law and in general for the operations relating to the common sphere of action.

The capital of these societies is represented by two series of shares, viz. : (a) Series *Y* which can be subscribed only by the National Bank of Agricultural Credit with a minimum of 60 per cent. of the share capital, and (b) Series *Z* which may be subscribed only by the agricultural co-operative societies of the area. The National Bank of Agricultural Credit may however subscribe the shares of Series *Z*, with the obligation of passing them on to the agricultural co-operative societies of the respective area as these are gradually formed.

The first issue authorised by each regional Bank is for 300,000 pesos, in shares assigned by name of 10 pesos each.

Chapter III (arts. 23-56) deals with the agricultural co-operative societies, enacting that they may be composed exclusively of members of the agrarian communities (*ejidatarios*) or of small farmers. Agricultural co-operative societies will take the form of societies with unlimited joint and several liability, and their objects will be as follows :

(1) to obtain the opening of credit for themselves or their members, by means of the operations indicated in this law, to be effected with the Bank of the respective area ;

(2) to grant to members credits for working capital or for improvements, commercial or secured on land or real property, involving the obligation on members to devote the amount of such loans exclusively to the operations for which they were granted ;

(3) to organise the arable or live stock farming, forest or other industry of the agrarian community (*ejido*), farm settlement or locality in which any society functions ; purchasing for resale or hire to members, for joint use, seeds, slips, implements, fertilisers, farm or other machines ; purchasing or constructing stand-pipes and channels for water or other permanent works of land development and improvement ; establish-

ing general warehouses, undertakings for the transformation of agricultural products, livestock or forest products, or undertakings for the joint sale of these products; also stores for the household supply of the farming population;

(4) to act as agents for the collection, transport and valorisation of members' products, under the terms of this law;

(5) to act as representative of the members for the regulation of all fiscal or administrative questions which may arise between the members and the municipal, State or Federal authorities, in respect of farming operations carried out by the members of the society, or between settlers and the administration of a farm colony.

(6) to direct, in accordance with the present law, the farming of the common lands of the agrarian communities (*ejidos*) or of small farmers;

(7) to act as agents of the Department of Peasant Savings (*Ahorro del campesino*); and

(8) generally to promote the economic organisation and cultural and social progress of members, as well as the raising of the standard of the rural household.

Membership of agricultural co-operative societies is open to:

(a) rural dwellers who are under the existing provisions, members of an agrarian community (*ejidatarios*), and

(b) small farmers. All members must be of Mexican nationality. For the purposes of the law, all persons are regarded as small farmer who habitually engage in the work of cultivating or otherwise utilising the soil, whether as owners, concessionaries, settlers, rent paying or produce sharing tenants, provided that all such work is carried on by them personally with the assistance of their family or with outside help, on condition that the number of persons not belonging to the family does not exceed five, and that the area of the farm is not larger than that fixed by the agrarian laws as the maximum for the small holding. Tenants, rent paying or produce-sharing, may form an agricultural co-operative society, if their immediate objects is to become owners.

Title II of the law deals with agricultural credit operations. In Chapter I (art. 57-64) the operations which the National Bank of Agricultural Credit is empowered to carry out are defined, and it is established that credits may be assigned by the Bank only to agricultural co-operative societies and to regional banks of agricultural credit. The Bank is empowered to issue agricultural bank notes, amortisable in five years at most, and bearing interest in no case more than one point higher than the discount rate given by the Bank of Mexico. The notes issued are guaranteed by liens on rights of pledge and by mortgages inherent in the loans granted for working or improvement, etc. The Bank may issue at the same rate of interest mortgage loans, redeemable by annual drawing of lots over a maximum period of 25 years.

In Chapter II (arts. 65-73) of the same Title provision is made for the creation by the National Bank of Agricultural Credit of a special Department of Peasant Savings (*Departamento de Ahorro del Campesino*) the object being to encourage the habit of thrift among the rural population of the Republic. This Department will be independent as regards management and book-keeping of the National Bank. The deposits, which will bear interest at 3 %, must be invested in loan operations under guarantee of pledge warrants (*bonos de prenda*) issued by warehouses.

Chapter III (arts. 74-80) contains provisions relating to the operations of the regional banks of agricultural credit, and Chapter IV (arts. 81-96) deals with operations of agricultural co-operative societies. Art. 86 lays down that, since the organisation of the *ejido* and of the small farm holding are of public utility, as also the regulation of the market of agricultural products and products of agricultural industries, provision should be made — in areas where in the opinion of the Bank co-operative organisation is sufficiently developed — for the joint carrying out, under the direction of the co-operative society, of sales, pledge operations, transport and conditioning of members' agricultural products, whether already transformed or not.

Title III (arts. 97-106) authorises the establishment of warehouses, for the purposes of regulating the agricultural products market, and for the use of the agricultural credit institutions.

The Law makes provision for two kinds of warehouses: I. Local warehouses, which will be the property of the co-operative societies and II. General warehouses, constituted as limited liability companies, established only by the agricultural credit institutions set up by this Law.

Title IV gives detailed regulations on the subject of loans in 3 chapters: Chapter I (articles 107-112). Loans; chapter II (arts. 113-127), Conditions, and Chap. III arts. 128-142). Guarantees of loans)

Title V (arts. 143-175) deals in 5 chapters with the regulation of the Public Register of Agricultural Credit. In this register will be entered all agricultural credit operations undertaken by the institutions coming under the present law, by the land improvement banks which operate in accordance with the general law on Credit Institutes and banking establishments, or by private individuals.

The Public Register of Agricultural Credit will keep special records and books.

The following will be the subject of entries in the Register :

- (1) the terms of constitution of the agricultural credit institutions and subsequent modifications ;
- (2) documents relating to increase or diminution of the number of members ;
- (3) letting or share tenancy agreements, or similar agreements drawn up with reference to property and lands which have been or are subject to agricultural credit operations ;
- (4) operations of purchase and sale, and documents, relating to restriction or modification of ownership, holding or usufruct of right in real property, lands, waters, buildings, hydraulic works or any other kind of permanent land improvement, which are already or are in course of being subjected to operation of agricultural credit ;
- (5) deeds and certificates of survey of boundaries, given for the purposes and in accordance with this law ;
- (6) contracts for hydraulic or land improvement works, subject to agricultural credit operations ;
- (7) land settlement and parcelling agreements ;
- (8) mortgages constituted by, in favour of, or with the guarantee of the agricultural credit institutions ;
- (9) guarantees on pledge, given by or in favour of these institutions ;
- (10) loan agreements for advances of working capital, improvement loans, secured by guarantee of real or landed property, negotiated by the banks of the new system with the co-operative societies ;
- (11) issues of agricultural bank notes and mortgage notes made under this law ;
- (12-16) other documents relating to the powers conferred by this law on the agricultural credit system.

Chapter V of the same Title deals with special entries in the Agricultural Credit Register. Thus the members of an agricultural co-operative society are empowered to demand entry in the Register, under their own names, of property held by them, for the purposes in particular of purchase rights.

Title VI (arts. 178-198) contains provisions of a general character and states the penalties of infringement of the Law. Chapter II (arts. 190-193) enumerates in detail the operations which the National Bank of Agricultural Credit, the regional banks of agricultural credit and the agricultural co-operative societies are expressly prohibited from undertaking].

MEXICO. — Decreto por el cual se fijan las bases a que quedará sujeto el comercio de abonos fertilizantes. — 23 de abril de 1931. — « Diario Oficial » T. LXVI, No. 14 (20 May 1931).

[The measures for the regulation of the fertilizers trade, provided for in this Decree, have been introduced for the attainment of various different objects which are explicitly laid down in the preamble. The preamble draws attention to the urgent necessity of a greater use being made in Mexico of fertilizers so as to diminish costs of production of agricultural products, increase the yield per unit of land and thus enable the Mexican farmer to meet the severe competition in the home market of the products of certain countries in which the study and practical adoption of chemical fertilizers have been carried to an advanced degree with resulting increase in yield and a reduction in the cost of production. Further the Mexican farmer must, if he is to be persuaded to make larger use of these fertilizers, be protected from abuses and fraudulent practices on the part of fertilizer sellers ; this implies the adoption of strict rules of a technical character and direct State intervention calculated to prevent abuses in a branch of trade which presents such notable interest for the national economy and to protect the interests of the farmer.

The Decree defines as " fertilizer " (*abono*) " any substance whether of home origin or imported, which is intended either in its natural condition or after being specially prepared, to be used for fertilizing the soil ". The Decree prohibits the sale of fertilizers not contained in receptacles duly labelled or stamped in accordance with the regulations laid down in this Decree. The label or mark must contain the following data :—

- (a) The name and address of the manufacturer or importer ;
 (b) The trade name of the product and the trade or manufacturer's mark if any ;
 (c) a guaranteed analysis clearly laying down the minimum percentage of some or all of the following elements . (1) nitric acid , (2) nitrate of ammonia ; (3) organic nitrogen ; (4) total nitrogen , (5) assimilable phosphoric acid ; (6) total phosphoric acid , (7) potassium soluble in water , (8) calcium , (9) sulphur , (10) other fertilizing elements which the manufacturer may wish to mention provided that, in the opinion of the Ministry of Agriculture, they can be described as such
 (d) The percentage according to weight of the organic raw materials when these are present in the fertilizer and have not been subjected to a technical process which has transformed the nitrogen, potassium or phosphoric acid into an assimilable product ;
 (e) The degree of pulverization in the case of basic slag, bone meal and natural phosphates.

Fertilizer manufacturers or merchants are required to exhibit the above indications in places where fertilizers are stored or sold as well as to notify to the Ministry of Agriculture the composition of the fertilizers passing through their hands. The same information must be given in the contract of sale where such a formal contract exists as well as in the invoice or note of delivery even when the fertilizer is sold in bulk.

The sale price of fertilizers is fixed according to the commercial value of each kilogram of the fertilizing element or elements contained in each quintal of fertilizer offered for sale

These rules are not applicable to persons selling in bulk and under their common names stable manure, dung, slaughter house offals, scrapings of skins and hides, sea weeds, sweepings and similar products obtained from industrial or agricultural enterprises, which are capable of being used as fertilizers

If the fertilizer does not correspond to its description the purchaser is entitled to a reduction in price fixed at twice the value of the missing substances. If this discrepancy is discovered before the fertilizer is dispatched the purchaser is entitled to a cancellation of the contract or a corresponding reduction in price. If again the principal fertilizing element in the fertilizer is 25 % less than the figure indicated on the label the purchaser may demand the cancellation of the contract and the refunding of the transport and other costs even if the fertilizer has actually been delivered. If the fertilizer has already been used on the soil the purchaser is entitled to a reduction in the purchase price, the refunding of the costs of transport and spreading as well as compensation for damage suffered by him from the use of a fertilizer of inferior quality.

The Decree lastly contains various measures regarding the penalties for breach of the provisions of this Decree ; these penalties will be applied independently of those applicable for breach of the law on marks and labels.

The Ministry of Agriculture and " Fomento " is entitled to make public the results of the analysis of fertilizers made in the official laboratories in application of this Decree. The Ministry is also responsible through the *Dirección de Fomento Agrícola* for the proper application of the Decree].

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MONTHLY BULLETIN

OF

AGRICULTURAL ECONOMICS AND SOCIOLOGY

FARM ECONOMICS

Some Results of the Comparative Statistical Study of Farm Accountancy Data in certain Countries for 1927-28.

PART II (*to be continued*).

(d) *Net Return.*

The *net return* is that fraction of the gross return which represents the actual return on the total capital invested in the farm. It is obtained by subtracting the farming expenses from the gross return. The same result may be reached by taking the increase (or decrease) of the agricultural own capital, the total of the cash receipts and expenditure, the total contributions in kind, and the total wage claim for the labour of the farmer and of members of his family (1). But this latter method has the disadvantage of leaving out the gross return, which forms a valuable indication of the type of farms which are the subject of study.

In trading or industrial enterprises the term net return is applied to that which remains when there is deducted from the gross return the working expenses including an amortisation, and calculated at the usual rate, the interest claim on the capital (interest on debts and interest reckoned on the capital of the person managing the enterprise). This is the profit and is known as the *profit on the enterprise*. The *net return* is thus this profit increased by the interest claim on the own capital of the person managing the enterprise and by the interest on debts.

The net return is the sum of the return on the own capital and the interest on debts, paid or not. It may and ought to serve as the basis for the valuation of lands. Actually if capitalised at a suitable rate, the value of the total capital invested is obtained. Once this value is obtained, all that is necessary is to subtract from it the inventory value of the live and dead stock and of the floating capital to obtain the capital value of the estate which differs from the ordinary capital value, which is the product of a valuation based on the local method of farming. The former of these two values is influenced by the personality and the vocational qualities of the farmer and the second is independent of these. The one value may be checked by the other if average accountancy data are available over a period of at least five years making some exactness possible.

(1) LAUR: Terminology and Bases for Use in International Statistical Researches based on Farm Accountancy.

TABLE VIII. — *Grouping of Farms in Germany by Increasing Order of Net Return in gold francs for 1927-28.*

Net return groups	Farms	Regions	Number of farm	Average area	Net return	Percentage of total area	No. in Recueil
- 50 to - 40	growing potatoes	North	16	117 —	—48.25	0.62	28(a)
	grass production with grazing	Bavaria A	50	13 —	—42 05	0.22	2(a)
	grass production with grazing	Bavaria B	30	28 —	—42 05	0.23	3(a)
	grass production	Bavaria A	108	14 —	—40 80	0 50	4(a)
- 40 to - 30	forage crops	North	49	30 —	—33.40	0 49	6(a)
	" "	"	46	421 —	—33.40	6.47	1 (b)
	growing cereals	"	90	118 —	—33.40	3.55	17(a)
- 30 to - 20	growing cereals	"	140	462 —	—29.70	23.01	4 (b)
	distilling potatoes	"	41	601 —	—23.45	8.23	10 (b)
	growing cereals	"	56	30 —	—26 —	0 56	10(a)
	raising slaughter cattle	North-West (N.)	29	34 —	—22.25	0.33	11(a)
- 10 to 0	forage crops	North	40	91 —	—8.05	1.22	7(a)
	mixed (unfavourable situation)	Württemberg	38	48 —	—5.10	0.61	13(a)
	raising slaughter cattle	North-West (N.)	80	66 —	—4.95	1.76	12(a)
	cattle farming	Eastern Prussia	79	416 —	—3.70	10.99	3 (b)
0 to 10	cereal growing	Silesia	30	316 —	1.25	3.18	7 (b)
	forage crops	Centre	63	46 —	3.70	0.97	8(a)
	cereal growing	Bavaria A	50	14 —	7.45	0.23	21(a)
	potato growing	North	27	350 —	9.90	3.15	9 (b)
10 to 20	grass production	Bavaria B	165	41 —	11.15	2.26	5(a)
	forage crops	Silesia	58	22 —	13.60	0.39	10(a)
	distilling potatoes	Eastern Prussia	25	606 —	13.60	5.06	11 (b)
	cattle farming	"	117	108 —	16.05	4.22	2 (b)
	forage crops	"	45	33 —	17.30	0.50	9(a)
	cereal growing	Centre	52	167 —	19.75	2.90	5 (b)
20 to 30	distilling potatoes	Silesia	30	375 —	22.25	4.89	12 (b)
30 to 40	mixed (situation average) . . .	Württemberg	51	57 —	30.05	0.07	14(a)
	cereal growing	Bavaria B	67	37 —	30.90	0.83	22(a)
	" "	Centre	162	45 —	39.60	2.43	19(a)
50 to 60	" "	Silesia	47	106 —	54.40	1.66	24(a)
60 to 70	" "	Centre	45	15 —	61.85	0.23	18(a)
70 to 80	" "	Silesia	178	28 —	79.15	1.66	23(a)
80 to 90	sugarbeet growing	Centre	51	219 —	87.80	3.73	8 (b)
90 to 100	" "	"	77	58 —	97.70	1.49	26(a)
140 to 150	mixed (favourable situation) .	Württemberg	18	42 —	141.40	0.25	15(a)
	sugar beet growing	Centre	30	17 —	144.70	0.17	25(a)
Total area 299,340 ha.			2,293	—	—	100	—

On small farms, the remuneration of the labour of the farming family plays a much more important part than the return from capital invested in the enterprise. "The small farmer does not purchase an income, but merely a field of activity. Also the capital value of his farm cannot be used to determine its price as is the case with larger farms. It is however reasonable that the price should not exceed the capital value of the soil realised in farms of average size in the same region" (1).

As previously for the gross return and farming expenses, a table and a graph will be given here relating to the amount of the net return according to the farming systems in Germany, and also a graph representing in percentages the relative importance of the main crops of the country.

The graph of the net return groups (Graph IV) shows the same tendencies as those for gross return and farming expenses. The displacement of certain systems and of certain regions is due to variations, within the groups, of the farming expenses in relation to the gross return. From Graph V it is possible to show, taking the farming systems and the regions separately, the importance of the size groups of the net return in relation to the total area of the farms the accounts of which have been surveyed by the Accountancy Offices. This distribution is influenced by economic factors, markets, the quality of lands and weather conditions. By way of comparison the following statement is subjoined showing in percentage of the area cultivated, the area of grasslands and grazing lands and of root crops in the different groups of districts in Germany (2):

District groups		Grasslands and grazing lands	Root crops
Eastern	Germany	19	14
Central	»	15	17
Southern	»	29	14
Western	»	29	12
North-Western	»	32	12

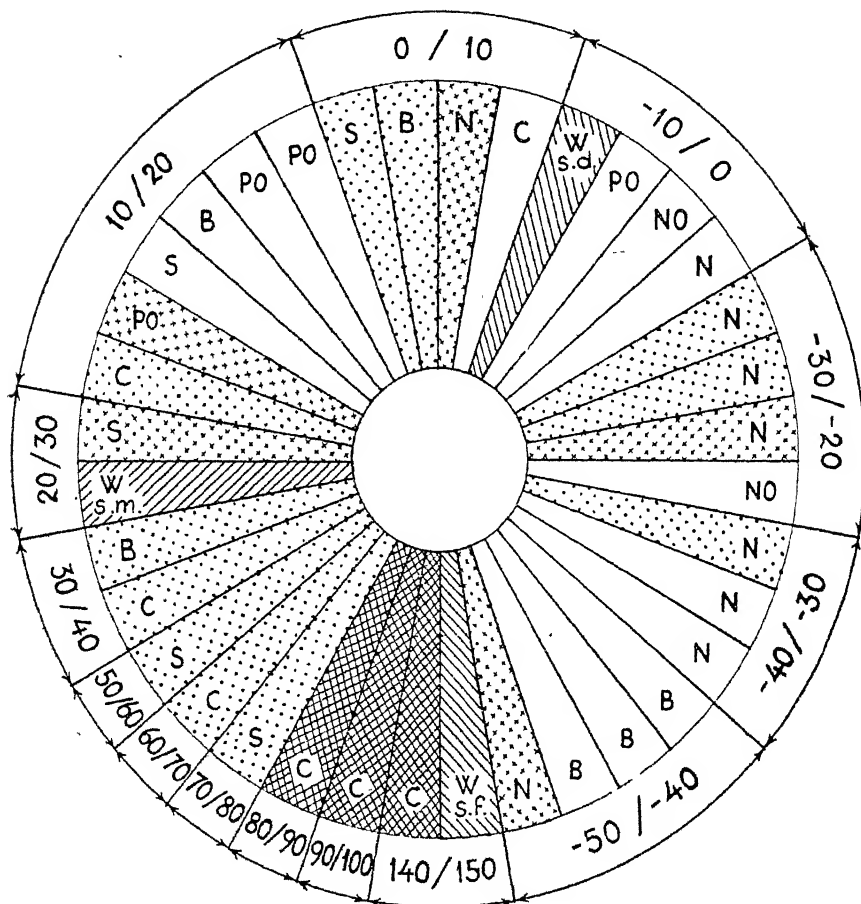
Germany is the country with most varied material, and accordingly has been chosen as giving an example of studies of the same kind which can be later undertaken for other regions, and even for the whole of the countries under consideration when the results of successive years are available. So long as these are not available it will be difficult to extend to the sixteen countries the comparison of results which it is relatively easy to make for a single country.

For the time being this main difficulty prevents the drawing of too rigorous conclusions from Graph VI. It can scarcely be too often repeated that accountancy results will never form a single sole source, and that the object of these articles is not so much to make use of the material contained in the *Recueil* for undertaking profound enquiries on questions of rural economy, as to show up to what point the figures of the first *Recueil* can already throw light on certain of these questions and reflect the general tendencies of agriculture in the countries under review. All that is being attempted is an indication of the problems for which, after a sufficient time

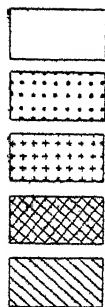
(1) LAUR: Comptabilité agricole de la petite et moyenne culture.

(2) FENSCH, Wert des landwirtschaftlichen Inventars. Berlin 1926.

GRAPH IV. — *Net return per ha. of 36 German farms for size groups of net return rising by tens (gold francs).*



Legend :



= farms on which grass production and cattle raising are the main features.

= " growing cereals.

= " " potatoes.

= " " sugar beet.

= " " mixed.

P. O. = Eastern Prussia.

N. = Nord

N. O. = North-West

W. s. d. = Württemberg, unfavourable situation.

W. s. m. = Württemberg, medium situation.

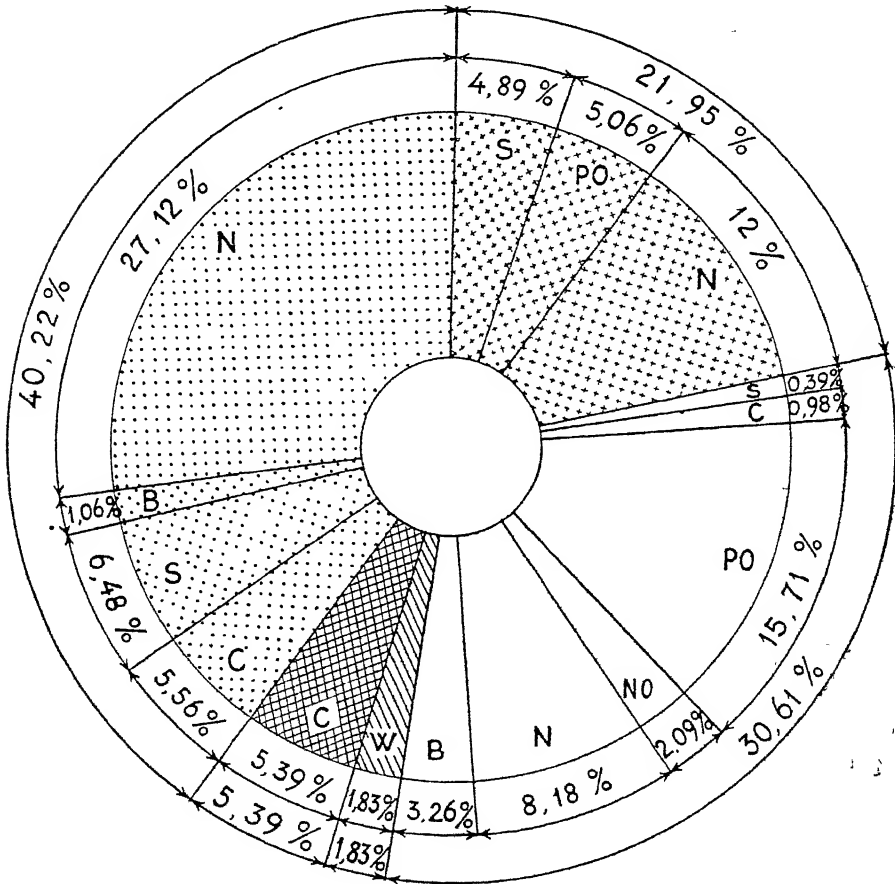
W. s. f. = Württemberg, favourable situation.

B. = Bavaria.

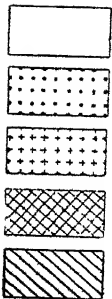
S. = Silesia.

C. = Centre.

GRAPH V. — Net return per crop, regions and in % of the total area of the farms the accounts of which were surveyed by the Accountancy Offices.



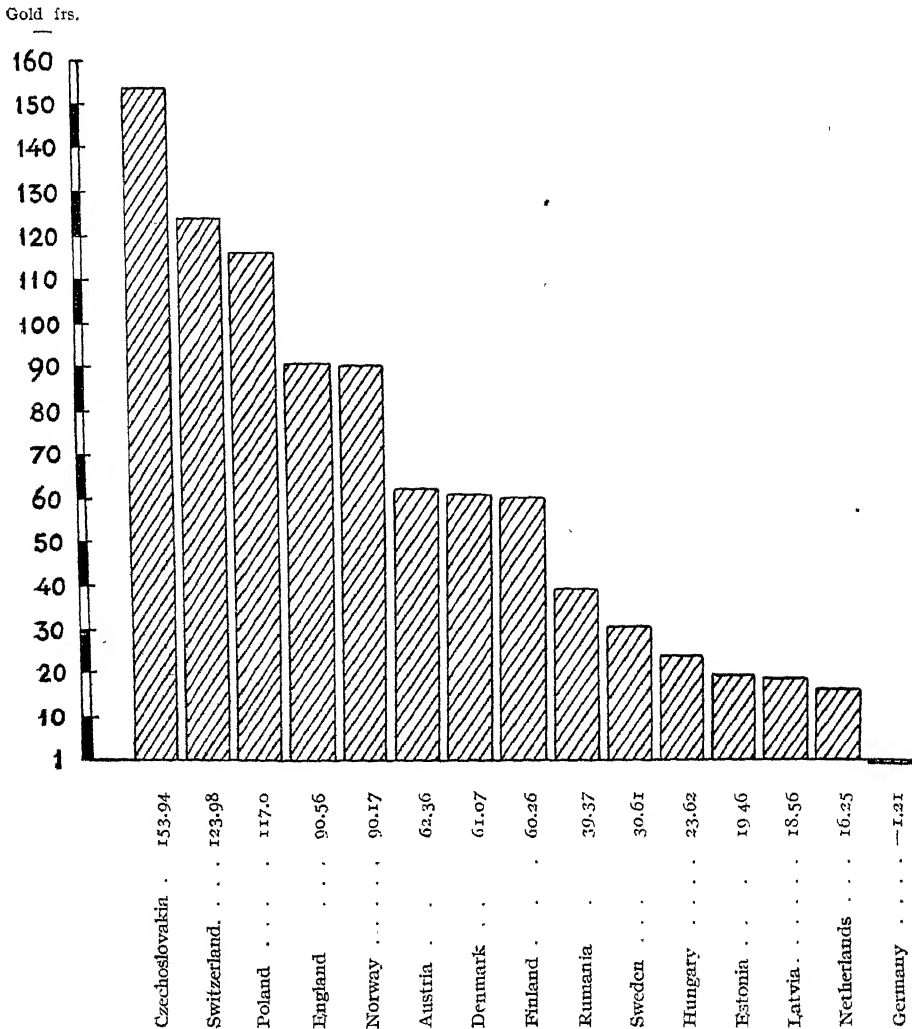
Legend :



- = farms on which grass production and cattle raising are the main feature.
- = " growing cereals.
- = " " potatoes.
- = " " sugar beet.
- = " " mixed.

P. O. = Eastern Prussia.
 N = Nord.
 N. O. = North-Vest.
 W. s. d. = Württemberg, unfavourable situation.
 W. s. m. = Württemberg, medium situation.

W. s. f. = Württemberg, favourable situation.
 B. = Bavaria.
 S. = Silesia.
 C. = Centre.

GRAPH VI. — *Net return in gold francs per hectare in 1927-28.*

has elapsed, a solution will appear from the results of the *Recueil*, taken side by side with similar results from other sources. The sources of information will supplement each other.

When these conditions are realised, it will be possible to make the net return the subject of a separate study, whereas even if all the material were at hand it could not be discussed within the limits of this monograph. The net return is, in fact, a function of the gross return and the farming costs. The amount of the gross return itself depends on the natural and economic conditions of the farms in the different regions and the different countries, on improvements in farming technique, on the prices of products, on State protection, and on other causes. The average size of the farms also exercises an influence on the returns, as appears from the

following table, in which the countries are places in descending order of net return as on Graph VI :

	Average size of farms —	
Czechoslovakia	26.24	hectares
Switzerland	14.30	»
Poland	13.64	»
Norway	17.26	»
Austria	30.46	»
Denmark	43.70	»
Finland	29.47	»
Rumania	29.06	»
Sweden	60.87	»
Hungary	1,435.47	»
Estonia	41.84	»
Latvia	45.57	»
Germany	130.54	»

It will be seen that the large farm in the country where it is fully represented has contributed to lower the level of the net return. It is in the countries where intensive farming prevails that, on the whole, the net return is highest.

This inverse ratio ought also to be seen on Table IX (pp. 244-7) on which is measured the net return in percentage of the total of agricultural capital, designated as farm assets. Normally the figure for the capital, per unit of area, would be the higher the more reduced the area. This is the case with Switzerland, Czechoslovakia and Hungary. In Switzerland, where the Office has grouped the farms by order of size, the tendency is very clear. As the area increases, the farm assets per hectare diminish, although the percentage of net return is increased. The same tendency is observed in each of the regions of Czechoslovakia :

(a) EAST :

	Forage crop farms small	Mixed farms		Sugar beet growing farms	
		small	large	small	large
Farm assets per ha.	1,975.08	1,526.64	837.23	1,916.01	1,089.29
Net return in % of the assets.	1.55	2.06	4.11	5.45	10.22

(b) WEST :

	Mixed farms		Farms cultivating sugar beet	
	small	large	small	large
Farm assets per ha.	2,682.09	2,070.74	8,454.31	2,082.55
Net return in % of assets	4.95	8.76	9.24	19.32

TABLE IX. — *Net Return in % of the total Farm Capital, Profit or Loss on the Total Farm*

Country Net return groups in % of farm assets	No. in Recueil	Farms	Regions	Number of farms
Denmark:				
1 to 2	1(a)	under 10 ha	All parts	141
	4(a)	30 to 50 ha.	"	188
	2(b)	over 100 ha.	"	59
	1(b)	50 to 100 ha	"	94
2 to 3	2(a)	10 to 20 ha.	"	109
	3(a)	20 to 30 ha.	"	140
Germany:				
— 1 to 0	13(a)	mixed (situation unfavourable)	Württemberg	38
1 to 2	14(a)	" (" medium)	"	51
3 to 4	15(a)	" (" favourable)	"	18
Switzerland:				
0 to 1	11(a)	up to 5 ha.	All parts	48
1 to 2	12(a)	5 to 10 ha.	"	182
2 to 3	13(a)	10 to 15 ha.	"	115
	14(a)	15 to 30 ha	"	123
	1(b)	30 to 100 ha.	"	32
Austria:				
2 to 3	7(a)	forest predominating	"	95
3 to 4	6(a)	vine-growing	"	5
4 to 5	3(a)	alpine stock farming	"	60
	2(a)	grass production with alpland	"	24
	1(a)	" " without alpland	"	123
	4(a)	mixed with cereals predominating	"	101
6 to 7	5(a)	" " vine growing predominating.	"	59
Czechoslovakia:				
1 to 2	2(a)	forage crops	East	5
2 to 3	4(a)	mixed (cereals and potatoes)	"	44
4 to 5	3(b)	" " " "	"	3
	1(a)	forage crops	West	30
	3(a)	mixed (cereals and potatoes)	"	78
5 to 6	1(b)	forage crops	"	3
	6(a)	sugar beet growing	East	19
8 to 9	2(b)	mixed (cereals and potatoes)	West	12
9 to 10	5(a)	sugar beet growing	"	45
10 to 11	5(b)	" " "	East	3
	4(b)	" " "	"	5
Hungary:				
— 1 to 0	I(b)	cereal growing (large)	Great Plain	18
0 to 1	2(b)	" " (medium)	Transdanubia	11
1 to 2	1(b)	" " (")	Great Plain	10
	II(b)	" " (large)	Transdanubia	25
	3(b)	" " (medium)	North	8
4 to 5	III(b)	" " (large)	"	10

Assets in % of the Gross Return and of the Farm Assets. Rate of Interest and Discount.

Average area in ha	Farm assets per ha	Net Return in % of farm assets	Profit (or loss) on total farm assets		Rate of interest			Official to rate of discount	No. in Recueil
			in % of gross return	in % of farm assets	land	buildings	tenants capital		
		%	%	%	%	%	%	%	
5.80	4,612.55	1.50	— 9.48	— 3.46	4	5	6	5	1(a)
38.10	3,133.30	1.60	— 11.20	— 3.23	4	5	6	5	4(a)
210.60	2,712.35	1.60	— 11.92	— 3.02	4	5	6	5	2(b)
67.10	2,773.90	1.90	— 10.02	— 2.85	4	5	6	5	1(b)
15.50	3,348.40	2.10	— 8.43	— 2.77	4	5	6	5	2(a)
25 —	3,299.80	2.20	— 8.45	— 2.61	4	5	6	5	3(a)
48 —	2,164 —	— 0.23	— 21	— 5.11	—	—	—	6.65	13(a)
57 —	2,513.15	1.21	— 15.55	— 3.39	—	—	—	6.65	14(a)
42 —	3,742.40	3.76	— 4.70	— 1.45	—	—	—	6.65	15(a)
3.76	11,413.20	0.69	— 27.62	— 3.95	4	4.50	4.50	3.50	11(a)
7.68	8,296 —	1.03	— 22.57	— 3.45	4	4.50	4.50	3.50	12(a)
12.50	7,327 —	2.02	— 15.70	— 2.50	4	4.50	4.50	3.50	13(a)
20.49	6,830.60	2.37	— 13.13	— 2.14	4	4.50	4.50	3.50	14(a)
50.40	5,576.50	2.73	— 11.82	— 2.07	4	4.50	4.50	3.50	1(b)
48.30	1,169.15	2.50	—	—	5	— 6.50	—	6.75	7(a)
4.12	4,859.50	2.60	—	—	5	— 6.50	—	6.75	6(a)
31.57	1,365 —	3.50	—	—	5	— 6.50	—	6.75	3(a)
18.98	2,107.75	4 —	—	—	5	— 6.50	—	6.75	2(a)
25.13	1,668.15	4.10	—	—	5	— 6.50	—	6.75	1(a)
19.51	2,133.85	4.30	—	—	5	— 6.50	—	6.75	4(a)
16.70	2,754.40	6.70	—	—	5	— 6.50	—	6.75	5(a)
10.42	1,975.10	1.55	—	—	4.50	— 5 —	—	5 —	2(a)
17.75	1,526.65	2.06	—	—	4.50	— 5 —	—	5 —	4(a)
83.87	837.25	4.11	—	—	4.50	— 5 —	—	5 —	3(b)
13.78	1,960.20	4.27	—	—	4.50	— 5 —	—	5 —	1(a)
17.64	2,682.10	4.95	—	—	4.50	— 5 —	—	5 —	3(a)
110.65	1,237.55	5.31	—	—	4.50	— 5 —	—	5 —	1(b)
13.13	1,916 —	5.45	—	—	4.50	— 5 —	—	5 —	6(a)
95.40	2,070.75	8.16	—	—	4.50	— 5 —	—	5 —	2(b)
19.09	3,454.30	9.24	—	—	4.50	— 5 —	—	5 —	5(a)
91.40	1,089.30	10.22	—	—	4.50	— 5 —	—	5 —	5(b)
119.45	2,202.55	10.82	—	—	4.50	— 5 —	—	5 —	4(b)
1,951.32	1,949.60	0.49	—	—	5 —	5 —	7 —	7 —	I(b)
349.41	2,012.60	0.71	—	—	5 —	5 —	7 —	7 —	2(b)
313.14	2,420.80	1.09	—	—	5 —	5 —	7 —	7 —	1(b)
2,305.45	1,699.20	1.39	—	—	5 —	5 —	7 —	7 —	II(b)
299.17	1,703.70	1.93	—	—	5 —	5 —	7 —	7 —	3(b)
1,557.14	1,769.90	4.00	—	—	5 —	5 —	7 —	7 —	III(b)

TABLE IX (continued). — *Net Return in % of the total Farm Capital, Profit or Loss on the total*

Country Net return groups in % of farm assets	No. in Recueil	Farms	Regions	Number of farms
Rumania:				
3 to 4	1(a)	mixed, heavily forested		30
8 to 9	3(a)	cereal growing	Dobruja	30
9 to 10	1(a)	cereal growing	Bucarest	3
Poland:				
4 to 5	1(a)	all types	South	255
6 to 7	2(a)	"	East	135
7 to 8	3(a)	"	Centre	293
	4(a)	"	West	121
Latvia:				
2 to 3		all types	All parts	117
Estonia:				
3 to 4		all types	"	250
Finland:				
0 to 1	2(b)	Various types of cattle farming	Centre	4
1 to 2	3(a)	" " " " "	"	115
2 to 3	3(b)	" " " " "	Ostrobothnie	5
4 to 5	1(b)	" " " " "	South	68
	5(a)	" " " " "	Ostrobothnie	57
	4(a)	" " " " "	North-East	26
6 to 7	2(a)	" " " " "	South-East	54
	1(a)	" " " " "	South	162
Norway:				
1 to 2		all types.	All parts	190
Sweden:				
0 to 1	4(a)	grass production with some rye and barley.	Lower Norrland II	21
1 to 2	3(b)	mixed (cereals with some sugar beet)	Centre V	67
	5(b)	mixed (sugarbeet with some cereals)	South V	13
	2(b)	mixed (cereals with some sugarbeet)	Centre IV	11
	1(a)	grass production with some rye and barley	Upper Norrland I	75
2 to 3	1(b)	" " " " " (1)	Lower Norrland IV	2
	7(a)	mixed (cereals with some sugarbeet)	Centre III	10
	3(a)	grass production with some rye and barley	Lower Norrland I	24
	6(a)	mixed (cereals with some sugarbeet)	Centre II	46
	2(a)	grass production with some rye and barley	Upper Norrland I	57
3 to 4	4(b)	mixed (sugarbeet with some cereals) (1)	South IV	6
	5(a)	" (cereals with some sugarbeet)	Centre I	53

(1) Taken from the publication: *Räkningsresultat från Svenska Jordbruk.*

Farm Assets in % of the Gross Return and of the Farm Assets. Rates of Interest and of Discount.

Average area in ha.	Farm assets per ha.	Net Return in % of farm assets	Profit (or loss) on total farm assets		Rate of interest			Official to rate of discount	No. in Recueil
			in % of gross return	in % of farm assets	land	buildings	tenants capital		
50 90	654 58	3.97	— 105.02	— 6 50	10—	12—	15—	6—	1(a)
9 40	1,167 20	8.27	— 16 29	— 3.43	10—	15—	15—	6—	3(a)
7 30	2,542 95	9.24	— 12.45	— 2.63	10—	12—	15—	6—	1(a)
5 80	2,710 30	4.73	— 9 05	— 1.24	5—	5.50	8.25	12—	1(a)
19 51	879 17]	6 15	1 33	0.27	5—	5 50	10.14	12—	2(a)
13.33	1,925.70	7.11	5.48	1.09	5—	5.50	9 97	12—	3(a)
18 05	1,821.90	7.95	8 31	1 93	5—	5.50	8.94	12—	4(a)
45.57	645.85	2 90	— 10 46	— 2.52	4.50	5—	6—	8—	
41 84	567.44	3.43	— 12.04	— 3.58	5—	7—	9.13	8—	
62.14	1,414.69	0.70	— 28 52	— 7.70	8—	8—	10—	6.87	2(b)
17.92	1,805.45	1.80	— 23.20	— 6.73	8—	8—	10—	6.87	3(a)
71.43	1,224.43	2.09	— 21.28	— 5.66	8—	8—	10—	6.87	3(b)
86.34	1,140.10	4.60	— 13.79	— 3.94	8—	8—	10—	6.87	1(b)
18.79	1,160.06	4 70	— 14.20	— 3.80	8—	8—	10—	6.87	5(a)
13.83	1,474 42	4.80	— 12.30	— 3.65	8—	8—	10—	6.87	4(a)
17.99	1,272.67	6.40	— 6 20	— 2.12	8—	8—	10—	6.87	2(a)
22.51	1,451.93	6.60	— 0 50	— 1.92	8—	8—	10—	6.87	1(a)
17.26	5,448.30	1.66	— 19.02	— 3.43	4.50	5—	6—	5.50	
14.45	2,431 —	0.90	—	—	5—	5—	6—	5.50	4(a)
223.50	1,918.92	1.10	—	—	5—	5—	6—	5.50	3(b)
239 —	2,968.13	1.20	—	—	5—	5—	6—	5.50	5(b)
78.32	2,212.53	1 40	—	—	5—	5—	6—	5.50	2(b)
7 30	2,244.53	1.70	—	—	5—	5—	6—	5.50	1(a)
78.50	2,392.04	2.03	—	—	5—	5—	6—	5.50	1(b)
33.90	1,931.44	2.10	—	—	5—	5—	6—	5.50	7(a)
6 90	2,592.41	2.40	—	—	5—	5—	6—	5.50	3(a)
15 —	2,102.59	2 70	—	—	5—	5—	6—	5.50	6(a)
14.10	2,098.43	2.80	—	—	5—	5—	6—	5.50	2(a)
78 —	3,548.40	3 —	—	—	5—	5—	6—	5.50	4(b)
6 77	2,501.98	3.10	—	—	5—	5—	6—	5.50	5(a)

In Denmark it is also observed that the increase of capital is in inverse ratio to the size of the farms : the lowest percentage of net return (to the farms assets) has been obtained on farms of less than 10 hectares, where the farm assets per hectare are double those of the large farms. In the following groups, the net return in percentage of the farm assets decreases as the area increases (as it does also in Switzerland and Czechoslovakia), with the exception however of the farms of from 10 to 20 and of 20 to 30 hectare, the size of which appears to be the optimum :

Size-groups of Danish farms	Net return in percentage of farm assets			
	1916/17-27/28	1922/23-26/27	1926-27	1927-28
	%	%	%	%
30 to 50 ha.	6.50	5—	0.90	1.60
50 to 100 ha.	6.30	4.50	1—	1.90
over 100 ha.	5.90	4—	0.70	1.60
10 to 20 ha.	6.90	5.50	1.60	2.10
20 to 30 ha.	6.80	5.50	1.80	2.20

In those Jutland regions where the soil is richer the farms belonging to the two last size groups are better represented than are the farms belonging to the other size groups, as is clear from the following figures :

	Less than 10 ha.	From 10 to 20 ha.	From 20 to 30 ha.	From 30 to 50 ha.	From 50 to 100 ha.	Over 100 ha.
	%	%	%	%	%	%
Sandy regions of Zealand, the southern islands, Funen and Eastern Jutland	70.21	56.88	65—	76.50	68.03	81.36
Regions of Central and Western Jut- land	29.79	43.12	35—	23.50	31.92	18.64

On the small farms pig raising is carried on on a much larger scale :

	Dairy products	Pigs
	gold francs	gold francs
less than 10 ha.	661.01	587.55
10 to 20 ha.	457.92	364.65
20 to 30 ha.	335.77	346.91
50 to 100 ha.	305.28	259.49
over 100 ha.	266.43	112.40

As regards Sweden and Finland, the results show tendencies altogether opposed to those of Switzerland, Czechoslovakia and Hungary. In Sweden and Finland capital invested per unit of area stands at the same level in the case of large farms as on the peasant or family farms and in consequence the net return in percentage of the assets is higher on the peasant farms than on the large farms.

Taking, for example, one region of Finland and one of Sweden :

Ostrobothnie (Finland).

	small farms	large farms
Farm assets per ha.	1,160.06	1,224.43
Net return in % of farm assets.	4.70	2.92

Centre (Sweden).

	small farms			large farms	
	I	II	III	IV	V
Farm assets per ha.	2,501.98	2,102.59	1,931.44	2,212.53	1,918.92
Net return in % of farm assets.	3.10	2.70	2.10	1.45	1.15

These special conditions are primarily due to the preponderance of forests and grazing lands. In Finland for example the area reserved to forests amounts to 85 per cent. of the total area of the farms :

	Centre		Ostrobothnie		Country as a whole	
	small	large	small	large	small	large
Area reserved for forests in % of total area	82.19	85.85	66.52	69.22	73.05	63.44

The influence of the forests is noticeable on the components of the farm assets :

	Lands		Buildings		Live stock	
	small farms	large farms	small	large	small	large
South	402.42	419.50	684.85	426.84	188.71	142.89
Centre	347.52	360.86	619.19	684.16	172.01	170.55
Ostrobothnie	453.41	462.36	423.03	281—	154.82	210.93

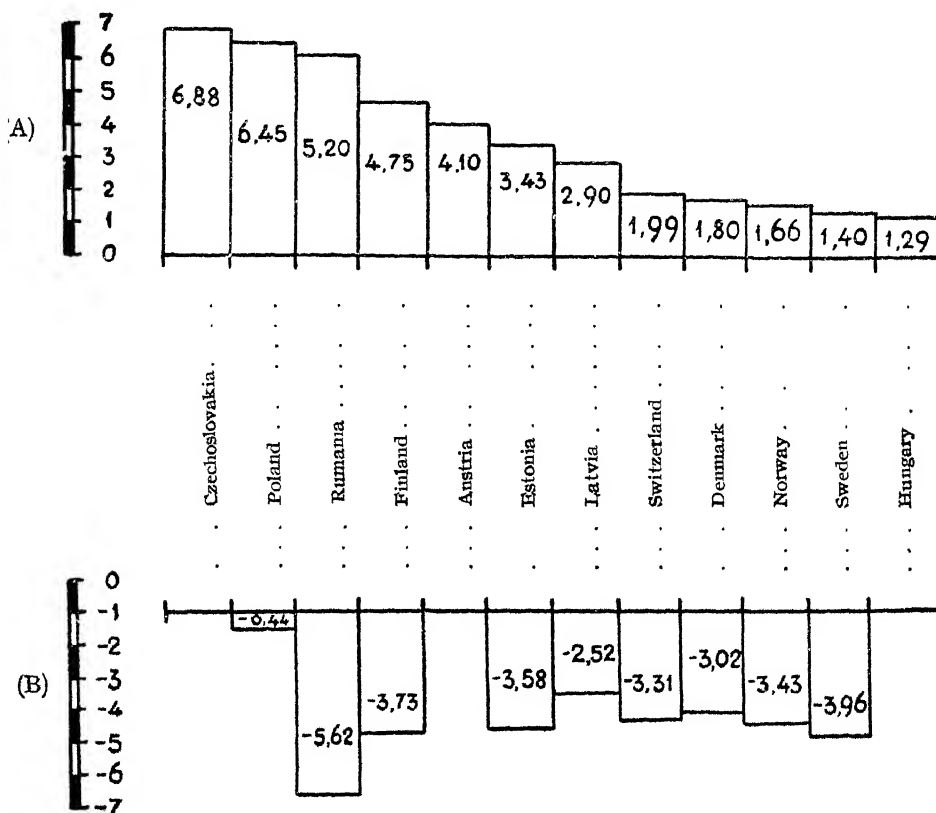
Whereas the difference in Finland in investment of capital as between the peasant and the large farms is insignificant, in Switzerland capital in land, capital in buildings and live stock per hectare decrease as the farms increase in size :

Average size of Swiss farms	Capital in land	Capital in buildings	Live stock
up to 5 ha.	4,126.55	4,514.75	1,158.87
from 5 to 10 ha.	3,220.30	2,597.50	1,017.00
from 10 to 15 ha.	2,414.24	2,338.05	879.97
from 15 to 30 ha.	2,596.33	2,075.83	937.84
from 30 to 100 ha.	1,989.09	1,524.14	721.08

The decrease is more marked in the column relating to capital in buildings. In Finland, the situation is closely connected with the shortage of credit, as is shown by the high rate, *viz.* from 7 to 10 per cent.

The causes of these differences are also of a social order. The method of life of the farmer of a family farm in the North is very different from that of the cultivator

GRAPH VII. — *Net return in % of the farm assets (A) and Profit or loss on total farm assets in % of the assets (B) by countries 1927-28.*



of Central Europe. For example he lodges his farm servants in a separate building. Space and the absence of exact documentation prevents any further discussion of this subject in this article.

In regard to the percentages of net return, the rates charged for capital and the official rate of discount are shown, on Table IX. In all countries the percentages of net return are decidedly below the usual rate of interest on capital, except in Poland and in Czechoslovakia, in which latter country they exceed this rate and even double it.

In the first of this series of articles, reasons were given for regretting the failure of certain countries to supply the profit or loss on the total farm assets.

This *profit or loss* is the difference between the net return actually obtained

and the *normal* net return, which the farmer would have obtained if he had lent this capital, invested in his farm, at the ordinary rate of interest. It is obtained by deducting from the gross return the cost of production, *i. e.* farming expenses and interest on capital. It corresponds to the *operator's profit or loss* when the farm is free of debt.

This lacuna makes it impossible to pursue a very interesting enquiry into the price of farm products. By way of example, it may simply be said that the average profit or loss on total farm assets amounted in Switzerland in 1927-28 to 12.73 per cent. of the gross return. The meaning of this is that prices of products should have been higher 12.73 per cent. to ensure to the capital invested in the average farm a normal earning capacity.

Price of milk for cheese making should have been	25.76 cts. per kg. instead of	22.85
» of young cows	2.15 » » » (live weight) instead of	1.91
» of heifers in calf	2.04 » » » » » » » »	1.81
» of young live stock	373 — » » » » » » » »	331 —
» of fat oxen	1 92 » » » » » » » »	1.70
» of fattened cows	1.42 » » » » » » » »	1.35

With regard to the extremely low figure of the profit or loss on total farm assets expressed in percentage of gross return, it results from the very high rate of interest on capital. This peculiarity appears from Graph VII. Rumania, which in the graph of net return in percentage of farm assets occupies the third place, is found in the last place on the graph relating to the profit or loss on total farm assets in percentage of the assets.

On Graph VII the Western countries, such as Switzerland, Denmark and Norway, which up to now were found at the head of the lists, yield place to the Eastern countries, not including Czechoslovakia, owing to the fact that these have invested less capital per hectare in their farming. There is less capital available in many of the Eastern countries than in the Western countries, a fact which is reflected in the following comparison between the profit or loss on total farm assets expressed as percentage of the assets, and the interest rates on capital :

Countries	Profit or loss on total farm assets in % of the assets	Rates of interest on capital		
		Lands	Buildings	Tenant's capital
Denmark	3.02	4—	5—	6—
Switzerland	3.31	4—	4.50	4.50
Norway	3.43	4.50	5—	6—
Poland	0.44	5—	5.50	8.10
Latvia	2.56	4.50	5—	6—
Estonia	3.57	5—	7—	9.73
Finland	3.73	8—	8—	10—
Rumania	5.62	10—	12—	15—

It may be repeated that it is not the intention here to proceed to a closer analysis ; on the one hand the documentation of the *Recueil* is fragmentary and on the other hand it would be necessary to make use of too large a number of sources.

(to be continued)

J. DESLARZES.

The Monographic Study of the Family Farm.

The economic and demographic significance of the family farm is becoming increasingly recognised in different countries. Such recognition has been delayed owing to the fact there is still very little real knowledge of the family farm, its structure, its methods of working and its dwellers. The scientific study of farm organisation was until quite lately concerned only with the farming of large estates, while the family farm on account of various technical and personal difficulties was neglected. It is therefore satisfactory that scientific interest and investigations have of late been directed on the family farm, so that it may be anticipated that it will by degrees be possible to grasp its structure and later even to exert an influence upon it.

Two differing methods have been followed by inductive research. The former, initiated by LAUR in the first instance and employed by him successfully for several years (1), is the method based on the utilisation of farm accounts. This comparative statistical method was later adopted by a number of individual workers and organisations. It will be sufficient to refer to the work of BURG (2) relating to the pre-war years 1911-12 and dealing with conditions of family farming in Baden, also to the increasingly numerous publications in recent years of the Accountancy Offices of the Chambers of Agriculture, of Bavaria, Württemberg and Schleswig-Holstein, and similar organisations of other districts where family farming prevails. As a result comprehensive statistical data are available, affording a valuable basis for the estimate of conditions of family farming. In recent years, very considerable contributions have been made by KRZYMOWSKI and HAASE (3), as well as by FENSCH (4), indicating by means of accountancy data the extraordinary importance of the family farm size groups for the German national economy and in particular for the supply of the German markets.

The literature of farm organisation in regard to the family farm has been fairly copious in recent years. Mention may be made of the able studies of A. TSCHAJANOW (5) on the "Lehre von der bauerlichen Wirtschaft", also of the articles and works of v. DIETZE (6), H. BECKER (7) and v. FRAUENDORFER (8), in which the subject is handled from a somewhat different standpoint. It is not proposed here to enter on a critical examination of these in detail, as that will be undertaken in a later publication now in preparation. This brief reference is all that is required in what is merely a cursory but comprehensive view of the German literature which is available on the subject of the family farm.

Of more general synthetic character are the latest publications of E.C. SEDR-MAYER (9) and H. ZÖRNER (10). These represent less the results of recent investigation, than a valuable synopsis of the facts so far recognised in regard to family farming and a comprehensive programme for future research.

In contrast to the method of research by means of comparative statistics there is the inductive method of the farm survey in monograph. This method is undoubtedly much more difficult than the first named. In the first place it means overcoming the innate distrust felt by the farmer, his instinctive dread of any summary of his position in writing or by means of numerical data. It is only if a personal contact is set up between farmer and investigator that there is a prospect of the latter achieving his object. Moreover on a small farm on which the family and farming interests are closely intermingled, it is much more difficult than on a large farm, where these are kept strictly apart, to obtain the positive figures that really represent the facts. The survey of the family farm in monograph is thus not merely a scientific, but also to a greater extent, a psychological problem. It is

also clear that this method of inquiry requires a much longer time than the statistical survey. This method is none the less bound to be increasingly employed, on account of the acknowledged superiority of its results. "The statistical method gives us an average taken from a number of farms, a normal image, in which the personal, individual element of the single farm is obliterated. The value of the statistical method is not thereby in any way minimised. It is this method alone that has provided a basis for work, undoubtedly still too narrow and needing constant enlargement, but offering till quite recently the only possibility of really getting into 'contact with the conditions of family farming. With all due recognition of the results achieved by the statistical method, it must be frankly admitted that this method required an expansion, a filling in of detail which can only be accomplished by the monographic method. The general outline, the normal image, obtained by the comparative statistical method, can only through the monographic method acquire any real individuality, and, as it were, relief" (11).

Fortunately some valuable contributions of the monographic order have appeared of late years, among which may be included not only surveys of individual farm undertakings, but also monographs describing certain areas, although strictly limited, of family farming. Among these latter may be mentioned F. BECKMANN'S (12) striking account of family farms in the Ruhr area with their capitalistic tendency. Similar, although perhaps with a more strictly economic trend, is the work of P. HERTENSTEIN (13) on the family farms in Upper Baden, where the author takes as basis a single commune which serves as the subject for detailed investigation.

Among the literature of monographs dealing with single farms, A. MUNZINGER'S basic work (14) stands in the first rank, on the work output of the farming family. Speaking frankly it has not escaped criticism on technical and even more on non-technical grounds. Whatever standpoint is adopted towards this work as regards details, its merit remains unchallenged in the view of all impartial critics, *viz.*, it that is the first positive attempt to assemble the conditions and experiences of family farming, based on an absolutely new method of investigation which surveys the family farming problem from the true psychological side. This work gives for the first time a deeper insight into the whole working of the family farm, a merit that has been ignored by much of the criticism which it has encountered.

Following MÜNZINGER'S work, contributions have been made to this problem by E. FRÜHSORGE (15) who has made a somewhat less detailed study of a series of East Prussian family farms, and by J. FROST (16) in his work on the Danish cottage farm holdings. There is also a valuable book by H. GMELIN (17) which deserves to be more generally known among present day work of the kind than seems to have been the case so far. Since it is up to the present the only monographic survey of a family farm made by the farmer himself, and as the basis is a strictly objective and numerical one, a short account may here be added following the main divisions of the book.

The author has endeavoured to make careful notes over 10 years of the details relating to the 15.5 hectares of his farm and since his averages are taken over a number of years — differing in this respect from any previous work of this type — he is in a position to give a valuable insight into the structure of a family farm. Averages based on complete figures are shown over a seven year period, 1919 to 1926; on account of the inflation however the figures expressing money values are limited to a three year period 1924-26. Although the book owing to adverse circumstances of various kinds could not be published till last year while data appear only up to 1926, it has not lost any of its value on that account.

The description of natural and economic conditions is followed by an account of the methods of collecting and handling data. It is striking that GMELIN although previously a technician in machinery expresses himself as quite opposed to the purely technical treatment of the farm and encourages instead a biological and organic conception.

The third part deals with farm requisites and means of production. Considering the extensive character of the farming, labour outlay is high, *viz.*, 55.4 man-days of 12 hours per hectare, a fact attributable to the unfavourable natural and economic conditions. Valuable figures follow as to the distribution of the farmer's work over the different branches of the work of the farm during the year, and percentage degree of employment of the farm servants of either sex. "Labour costs" are reckoned as consisting of cash wage, insurances, etc., board, lodging and part of the housekeeping expenses, with the striking result that in comparison with industrial wages the farmer's own work on a small farm is remunerated on an average at 0.30 RM. per day. It is of interest and importance that GMELIN comes to very similar conclusions in this respect to MÜNZINGER. The "horse labour outlay" amounts to 19.8 horse-days per hectare of arable land at a cost of 2.67 RM. per horse work day. In connection with the heavy horse charge on the family farm, it is of interest that GMELIN reckons for his horses an average utilisation of 51.4 per cent. only. As in the case of human labour information is given in respect of the distribution of horse labour over the separate months and branches of farming.

Exceptional interest attaches to the chapter dealing with "Walking Time spent in connection with the farming of outlying fields". It relates to two areas of arable and meadow pasture land lying at distances of from 1.85 to 2.77 km. from the farm. It was found that 19 per cent. of the crop values of these lands, or 23 per cent. of the total expenditure on their cultivation, was used up merely in connection with traversing the distances separating them from the farm. The percentage of expenditure of this kind increased practically with the square of the distance from the farm. These figures give a particularly clear illustration of the importance of consolidation operations for economic farm work in districts where there is marked subdivision of holdings.

Of equal importance is the chapter on machines. The careful records kept of the utilisation time and the cost of the different machines forms a valuable contribution to the subject of this heavy charge on family farming. On account of the basic importance of these calculations some figures are reproduced here:

	Degree of utilisation in relation to the 8760 work-hours available	Interest and amortisation charge per farming hour
Plough	2.32 %	0.04 RM.
Electric motor	2.49 »	0.11 »
Chopping machine	1.39 »	0.29 »
Mowing machine	0.68 »	0.54 »
Hay maker	0.22 »	1.50 »
Seed drill	0.09 »	7.60 »

These figures require no commentary and make quite clear the necessity for thinking on capitalistic lines in modern family farming.

The fourth part gives a careful description of the separate branches of farming, cultivation of forage crops, cereal growing, potato growing, stock farming, dairying, pig-, poultry- and bee-keeping, and thus gives a real insight into the structure of the farm.

The last section deals with some "economic relations". In reply to the questions: Whence does the owner of a family farm obtain his money and where does he spend it? GMELIN assumes four zones — like the districts of Thünen — and establishes the turnover numerically in relation with each of them. It appears that his farm earns more from the two nearest zones, the "commune and immediate neighbourhood", than it spends, that the third zone (the "nearest small town") makes much more money out of the farmer than he does out of it, while in the two last zones ("nearest large town" and "outer zone"), receipts and expenditure almost balance each other. Such results — perhaps apart from the well-established economic alliance between the family farm and the small town — are naturally not to be taken too generally, but are none the less very valuable for the single farm. The great disproportion existing between the prices obtained for live stock products and the top prices announced on the Munich product exchange is illustrated in a further chapter. It is readily intelligible that this disproportion is due to a number of causes, mainly lying in the farm itself, such as quality of the products, the time of placing on the market, etc.

Taken as a whole, the work represents — in spite of its later appearance — a preparatory work to the most recent publication of MÜNZINGER on family farming and breaks ground in method and in results. In forming a judgment of the work of GMELIN, it is not relevant to enquire if the farm in question is worked at a profit, or if its manager is a professional farmer. The value of the work lies in the fact that it indicates a new and special method of investigation of the structure of family farming, that it supplies data which are above challenge and are based on observations extending over years and prove the immense difficulties under which the German family farm has to work at the present time. The book shows with startling clearness that the present crisis in agriculture is first and last a crisis in family farming. In respect to the regular working of economic laws on the family farm, GMELIN'S work must have importance and interest even outside Germany. It gives us further proof that economic comprehension of family farming is better attained by the monographic method than by the statistical. Naturally the one does not exclude the other. The diffusion of statistical methods must be in any case brought about through monographic studies of this type.

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ECONOMIC AND SOCIAL CONDITIONS OF THE AGRICULTURAL CLASSES

Some American Studies in Rural Sociology.

The agricultural crisis which has affected every country of the world since the war, has obliged governments, associations, private individuals and especially agriculturists to look outside the theoretical field, where so much energy has been spent in the past, for a solution of certain general and particular problems. These problems, it is true, existed before the crisis, but the crisis aggravated them to such a point as would inevitably have led to conditions of political and social disorder had an attempt at their solution been further deferred.

Various causes, historical, social and political brought the problem of rural life to the fore in the United States, where it has been carefully studied and where some practical solution of certain of its most characteristic aspects has to be sought much sooner than elsewhere. In explanation of this fact, it must be remembered that the American rural population has been from the time of the first pioneers, a very important element in the political life of the country. The American farmer had the possibility of making his voice heard even where his numerical importance was not very great. The American political system enabled the country population to exercise an influence over the representative political bodies; and measures intended to promote the well-being of the farmers date in the United States from the very moment when the spiritual and national unity of the country was attained. The rural problem has always been a national problem in the United States: local in the first place, and federal when the several states were not able to cope with the problem alone.

It is interesting, therefore, to examine the development of studies and measures relating to the rural problem in the great trans-Atlantic country. It is necessary to limit our remarks to the recent few years partly because a quantity of details concerning the country and rural-urban population have been dealt with scientifically in recent times. Even the much discussed problem of the rural exodus, when examined on the basis of ascertained data and in its entirety rather than in its details and local manifestations, has revealed itself, in the United States considered as a whole, a lesser evil than it has often appeared to be, though no one could possibly deny the damage it has done locally for instance in some sections of Virginia, New England, and several of the Southern States (1).

American students and investigators started from the assumption that, till some time ago, in the study of living and labour conditions of the American rural population one important element had been entirely put aside namely the element represented by the rural class itself. The cooperation of that class was appealed to and the rural population has responded to the appeal of students and investigators in an admirable way. In fact the response has been much more prompt and more satisfactory than it had been the case in the course of investigations among the

(1) As a typical study on this subject see "Rural Depopulation in certain Tidewater and Piedmont Areas of Virginia" by WILSON GEE and JOHN C. CARSON, University of Virginia, 1929.

population of the cities. And this because the farmer, generally an essentially practical individual, has understood at once that the request for his cooperation was susceptible of practical results, while among the urban population, particularly of the lower classes, the work of the sociologist and investigator was long considered as an unwarranted intrusion into affairs which did not concern him. It must be considered also that the rural population, as a whole, is much more homogeneous than the population of the cities. This is true everywhere, but more particularly so in the United States, where the shifting of the urban population is as continuous as it is rapid — while in the country districts it has been fairly active in the early period, that of pioneering from East to West — this shifting become very active at a later period in consequence of immigration from European countries, and became once again “static” in a third and more recent period. Although the ethnical groups of the American Middle West have been for generations integral parts of the national unit, they nevertheless maintain all the characteristics of their northern Germanic origin. In California the Latin (chiefly Italian) element, although in reality better assimilated than the older ethnological group of the Middle West, has also preserved certain national characteristics which it will probably never lose. It is obvious therefore that homogeneous groups of old traditions and well developed civilization have a clear idea of their needs and rights and are in a condition to furnish reliable information as to every form of their activities, both as family and professional groups. It is only necessary to ask for their cooperation in a manner accessible to their culture and more especially in a practical form; care must be taken to avoid that attitude of “abstract preaching”, lamented by an American student whose name we will have to mention again: Professor Zimmerman.

This precaution has been taken in the United States. The problem is now to furnish some practical demonstration of the notable contribution to the knowledge of the living conditions of the rural class resulting from the adoption of the method which has made the cooperation between students and the rural population both practical and fruitful.

A decisive impulse to this new system of investigation came from the Experimental Agricultural Station of the University of Minnesota which in 1926-27, following a suggestion made in 1924 by Prof. Carle C. Zimmerman of the Department of Sociology. The Station instructed Professor Zimmerman to undertake an investigation on “Incomes and Expenditures in the villages and small towns of the State”. It was thought that only a knowledge of the real conditions of those people would make possible the discovery of remedies for a situation which two very grave crises had since the war made almost unbearable. The sociologist decided to concentrate his attention on the following fundamental objects:

- a) give a comprehensive outline of the living conditions of every social class in the villages and small towns of Minnesota, as they result from the family budget;
- b) on the basis of the data at his disposal, furnish a means of comparison between the mode of life of the agriculturists and that of classes engaged in small trade in the villages and small towns;
- c) give the agricultural and the various types of village families an indication as to how they could better their living conditions “in so far as these are determined by the way their income is spent”.

As regards this last point and as far as the United States are concerned, there is no doubt that the rural classes are not less desirous than the city dwellers to better their living conditions. In a certain sense, it may be stated that the former can teach a great deal to the latter. Another discovery made as a result of the investigations is that country people in the United States preserve their characteristics

intact in centres of a limited population: that is centres numbering between 250 and 5000 inhabitants. Beyond that figure one begins to notice characteristics peculiar to urban centres. In reality some of these characteristics are noticeable even in centres of less than 5000 inhabitants; but the phenomenon of urbanization is proper to groupings of about that figure. This has been ascertained in the course of one of the various investigations conducted by the University of Minnesota, and has been confirmed by a number of investigations carried on elsewhere during the last seven or eight years.

Seeing that this investigations is typical and it can be asserted to have been fundamental in this field of research it may be of interest to gave its salient characteristics.

The inquiry was extended to 395 families, comprising an average of 4.2 persons of whom 3.3 were adults. The difference is constituted by women, children and old people who, as a rule, need less food and reduce therefore the number of "adults or equivalents". The class of persons which were the object of the investigation included workmen, professional people, business men and others living in small rural centres. These families were divided, according to the type of occupation and social status, in the ten follwing groups:

1. widows and unmarried women.
2. retired farmers.
3. unskilled labourers.
4. semi-skilled labourers.
5. skilled labourers.
6. employees, including factory managers and head labourers.
7. business people with an income lower than 3000 dollars a year.
8. professional people of the same category.
9. business people with an income over 3000 dollars a year.
10. professional people of the same category.

The following table indicates the distribution of families by professional groups:

TABLE I. — *Distribution of Families by Professional Groups.*

Condition	Number of families	Number of persons	% total of families	Average persons by family	Average adults by family
Widows and unmarried women	18	61	5	3.3	2.7
Retired farmers	22	104	8	3.2	2.6
Unskilled labourers	41	195	10	4.7	3.5
Semi-skilled labourers	46	218	12	4.7	3.7
Skilled labourers	41	179	10	4.3	3.4
Employees, including factory managers and head labourers	78	356	20	4.5	3.6
Business people with an income lower than 3000 dollars a year	58	247	15	4.2	3.4
Professional people of the same category	25	94	6	3.7	3.0
Business people with an income over 3000 dollars a year	37	150	9	4.0	3.2
Professional people of the same category	19	73	5	3.8	3.1
	395	1,677	100	4.2	3.3

The Table shows that, as is always the case in all rural communities, semi-skilled labourers and employees have the largest families. Of special interest in a country like the United States, is the fact that the inhabitants of the localities under

investigation, mostly of Northern (1) origin, who have been settled in Minnesota for four or five generations, when gathered in small groups (up to 3000 inhabitants), preserve traditions, customs and habits of their country of origin. In the larger centres these habits tend to change and the assimilative process is the more rapid as the phenomena of invading urbanization are greater.

Significant for its social effects is the type of habitation of these Minnesota rural groups. In 95 % of the cases the family lives in an isolated house which, in the proportion of 55 %, is its own property and free from every form of indebtedness. The remaining 5 % is represented by families who live in buildings comprising several apartments and housing several family units. This is the first indication of a tendency towards urbanization. The investigation brought out the fact that 41 % of the heads of families had received a high school education, that among them about one half had received some university instruction, and lastly that the number of professional men practising in a rural centre is in proportion to the greater or lesser number of cultured people in the community.

INCOME, EXPENDITURES, DEFICITS. — From data gathered in the course of the investigation it appears that the general tendency of these Minnesota families is to keep their expenditures within the limits of their budgets. The family budgets permanently in deficit are very few. The social status generally corresponds to economic conditions, *i. e.*, families of the upper classes have larger incomes or *vice versa*. As regards items which appear in the budgets higher than the family income, the following table will appear rather instructive. The highest points are reached by expenditure as a result of sickness, failures, unemployment, and money spent on buildings for habitation and other use. In this last case, one can speak of deficit only in a relative and temporary sense. Another item that accounts for deficits in the family budgets is the automobile, which together with the radio, is the cause of general increase of expenditures.

TABLE II. — *Causes of Expenditures in Excess of Incomes.*

<u>Cause</u>	<u>Number</u>	<u>Percentage</u>
Illness	56	28
Old age.	8	4
Failure of business of bank, unemployment	39	20
Building of house and other buildings	62	31
Automobile	25	13
Others	8	4
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Total . . .	198	100

(1) 40 % Scandinavians, 10 % Germans, 12 % of English, Scotch, Irish origin, or natives of the U. K. for at least four generations, 3 % Canadians, 25 % of various descent.

Sources of Income. — Generally the head of the family is the principal producer of income in these agricultural and semi-agricultural communities of Minnesota among which the more prosperous element shows a tendency to invest in urban property which promises better returns. The same tendency is noticeable among the professional group of retired farmers and among widows and unmarried women. The latter often add to their income by keeping boarders; a source of income very common in the United States; the retired farmers devote themselves to and derive their income in addition to the investment of their savings in urban property, from occupations of trust, generally in the inhabited centre, nearest the place where they have been long known. Retired farmers figure very high also among the classes that show the greatest sense of the necessity of saving. As a rule such necessity is felt more as one ascends the social ladder. The habit of investing in industrial bonds is very little practised. But this is due chiefly to the fact that in the small provincial cities and country towns the proper facilities to encourage such form of investment are lacking. The lack of an active market of this kind has some bad effects. It often happens that the savings deposited in a local bank either run the risk of bad management on the part of the bank itself, or else — since the bank generally invests the money deposited in agricultural enterprises or enterprises in some way bound up with the fortunes of an agricultural season — of serious and often irreparable loss in the event of one or more successive bad harvests.

This situation was in fact verified during the two or three years previous to the inquiry dealt with here. To facilitate therefore the acquisition of safe industrial bonds by the agriculturists and inhabitants of towns and small provincial cities amounts to the same as guaranteeing their savings and prosperity.

One of the greatest difficulties in inquiries of this kind seems to be to determine the exact wealth of a family or of a group. Only approximate estimates can be obtained of these, because the results although sometimes based on the investigations of the inquirer, are mostly obtained from the declarations of the people themselves who are the subject of the inquiry. It is easier on the contrary to determine the expenditures, an important item of which is now-a-days and everywhere represented by the automobile. It is evident however that the automobile only seldom represents, for the rural population, an object of luxury. It is rather a necessity or at least a useful means of transportation. The following table indicates the percentage in the distribution of automobiles among the various agricultural groups :

TABLE III. — *Percentage of Distribution of Automobiles among the Various Agricultural Groups.*

Status	Do not possess automobiles	Possess small automobiles	Possess other types of autom.	Possess types not qualified	Total
Widows and unmarried women	83	11	6	0	100
Retired farmers	37	19	44	0	100
Unskilled labour	71	24	5	0	100
Semi-skilled labour	35	48	17	0	100
Skilled labour	27	49	22	2	100
Employees and factory managers	18	50	51	1	100
Small traders	38	31	34	2	100
Small professional men	8	44	48	0	100
Big business men	8	24	68	0	100
Big professional men	5	21	74	0	100
Average %	31	32	36	1	100

As regards the general expenditures of these families, taking as a basis an average income of 2403 dollars for each family, we find that they are proportionately distributed as follows :

Household expenses	\$ 582
Food	" 505
Clothes	" 267
Medical assistance	" 90
Various (personal expenses)	" 253
Automobile	" 201
Investments and savings	" 575
<hr/>	
Total	\$ 2,473

The average family expenditures by categories or groups of categories are as follows :

TABLE IV. — *Average Family Expenditure of Professional Groups on Different objects.*

Condition	Household expense	Food	Personal clothing	Medical assistance	Various	Auto- mobile	Invest- ments	Total
	\$	\$	\$	\$	\$	\$	\$	\$
Widows, etc.	374	400	86	38	70	10	137	1,121
Retired farmers	578	342	175	100	182	63	347	1,767
Unskilled labour	221	397	125	43	85	30	60	961
Semi-skilled labour . . .	391	486	193	66	137	70	209	1,552
Skilled labour	472	525	230	123	169	110	314	1,943
Employees, etc.	751	575	944	107	311	314	508	2,910
Small traders	451	476	241	72	136	127	438	1,086
Small professional men . .	465	528	283	70	383	264	506	2,499
Large traders.	1,091	590	405	121	514	468	2,185	5,374
Higher professional men. .	1,133	729	632	167	683	657	1,591	5,592
Total average	582	505	267	90	253	201	575	2,473

These figures, while confirming the general rule that the higher classes show a greater realization of the necessity of saving, indicate also that generally these rural and semi-rural families give only a relative importance to some items, food for instance. Personal expenses grow with the rising in the social ladder ; the habit of investing money in industrial bonds is not practised by the agricultural class for the reasons already indicated. As regards the " various expenditures " of a personal character, it can be seen that they are accounted for as a rule by the following items : contributions to religious and educational institutions, gifts, travelling, tobacco, books, newspapers, toilet and hairdressing services, theatres, entertainments,

club, lodge or brotherhood dues, vacations, and incidental expenses. Retired farmers appear most generous in their contributions to religious and charity institutions, while in proportion the higher classes seem less inclined to support such institutions financially. The average expenditure of this kind, both by individual or group, does not appear to be influenced by the numerical importance of the inhabited centre.

The degree of education increases with the rising in the social ladder, and naturally the expenditure for educational purposes grows proportionately. This is true also of all the expenditures for recreation, organizations, travelling, and equally of the quantity of reading matter (newspapers, magazines, books). As regards quality of such reading matter, there is not much difference among the various classes.

Social conditions influence also the amount of expenditure on medical assistance, although the proportion is reduced in the case of the professional classes owing to the fact that the physician generally belongs to such classes himself and lends his professional services on special terms.

From a social point of view it is interesting to consider the birth-rate data among the families of rural centres. Figures relative to expenditures for medical assistance to childbirth indicate that conditions among the various professional groups under examination coincide with conditions of such groups all over the Western World: fewer births among the higher classes, minimum birthrate among the agriculturists and farmers, medium birthrate among the business and professional classes, with a prevalence of the former over the latter. It would then seem that "rurbanization" is responsible for a birth rate limitation policy among the rural communities. In fact this tendency is evident enough to cause some alarm (1).

It has already been pointed out that the rural families of the small Minnesota centres, in the proportion of 95 %, either have their own house or are doing all they can to get one. Although the acquisition of a house, generally through a loan, represents a charge on the family budget it appears that this charge is willingly met and easily borne. The acquisition of a house is a very important factor from every point of view, because it means a greater family and collective stability. With the improvement of social conditions there is an increase of the expenditures on household improvements and on embellishments of both the inside and outside of habitations.

* * *

The data furnished so far might appear insufficient, because they are limited to conditions prevalent in one only of the states of the North American Union, and because they refer to a condition existing there some three years ago. But it must be noticed: (1) that in dealing with living conditions of the rural class in America, it would be difficult to find, both from the point of view of topographical situation and of "culture-type", a better State than Minnesota (a wheat centre of the very first order) from which to obtain an adequate idea of rural life in the United States as a whole; (2) that the data indicate the correctness and the logic of the method employed in gathering and compiling them; (3) that similar investigations in other States of the Union, besides being based on the method of co-operation between

(1) ZIMMERMANN and SOROKIN, in their volume on "Social Economics" mentioned above, do not hesitate to denounce this tendency as positively dangerous already, and even suggest checking by law the birth control propaganda which is actively conducted in the U. S. A.

investigators and rurals, deal with the same matter even though the sources of income and expenditure may naturally vary with the the difference of the crops grown in the various states and sections of the North American continent; (4) lastly that the phenomena of prosperity or poverty of the rural classes, the improvement or decay of conditions of individuals and groups within the same classes, "rurbanization" as an indication of the end of the descending parabola of rural exodus and the beginning of rural-urban exchanges which tend to become general, are common to all the North American continent. The investigations which have accompanied or followed those made by the Experimental Station of the University of Minnesota do not throw any greater light over the phenomena relative to the living conditions of the rural classes. Nor could we, in such study as ours, take up the discussion of special problems, such as, for instance, the respective conditions of white and coloured rurals in the Southern States, or the conditions of particular Indian settlements, in the North, North West, West and South West of the United States. Special studies on these particular problems have been made, and some of them are of a capital importance (1), as are those made in various sections of the United States, to ascertain in detail and to specify the quality and quantity of food consumed by rural and semi-rural families (2). They are recent studies, conducted according to the new method and they too are a consequence of the need felt everywhere to examine the rural problem in every detail with a view to finding a solution to it beneficial to the rural classes and to the economy of the whole nation: of every nation, in fact.

But the problem of family income and expenditures, of the family budget in other words, is not a rural problem only. The need has in fact been felt of extending the investigations to urban families; and the Department of Agriculture of the United States Government has now taken the initiative of gathering data on the living conditions of all the families of the entire nation. Following a resolution adopted the 1st of January of the current year, the Federal Department of Agriculture will furnish every American family with a paper containing precise, concise, complete questions and not less clear and precise instructions, to make it possible for every family in America to indicate its real budget (3). The system of cooperation between the investigating sociologist and the general public has thus become national since the inquiries conducted by the University of Minnesota and followed by other bodies and students has proved equal to the necessities of the moment and to the importance of the problem at hand. It will not be without interest for all the students of sociological problems and for all the governments of the civilized countries to know the result of the initiative taken by the American Government: an initiative chiefly intended to ascertain an economic fact, but conducted also with a view to social ends to which the increasing unrest, due to the general economic depression, has drawn the attention of responsible authorities everywhere.

V. F.

(1) See Rural Standards of Living. U. S. Department of Agriculture, Bureau of Agricultural Economics, Agricultural Economic Bibliography No. 32; Washington D. C. August 1930.

(2) As a typical study on this subject see Bull. No. 502; April 1930, "An Economic Study of Food Consumed by Farm and Village Families in Central New York", by FAITH M. WILLIAMS and JULIA E. LOCKWOOD, Cornell University Agr. Exp. Station, Ithaca, N. Y.

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MONTHLY BULLETIN

OF

AGRICULTURAL ECONOMICS AND SOCIOLOGY

FARM ECONOMICS

Some Results of the Comparative Statistical Study of Farm Accountancy Data in Certain Countries for 1927-28 (*continued*).

PART II (*continued*).

(e) *Social Income.*

The farm undertaking does not merely provide an income for the farmer himself together with interest on the capital required by such undertaking. A part of the income from the farm goes to the employees, to the creditors, and also to the State in the shape of the taxes collected. The totality of the income of the farming enterprise is designated in economic science as *social income*, and consists in the general increase in value obtained by the whole community through the operation of the farm.

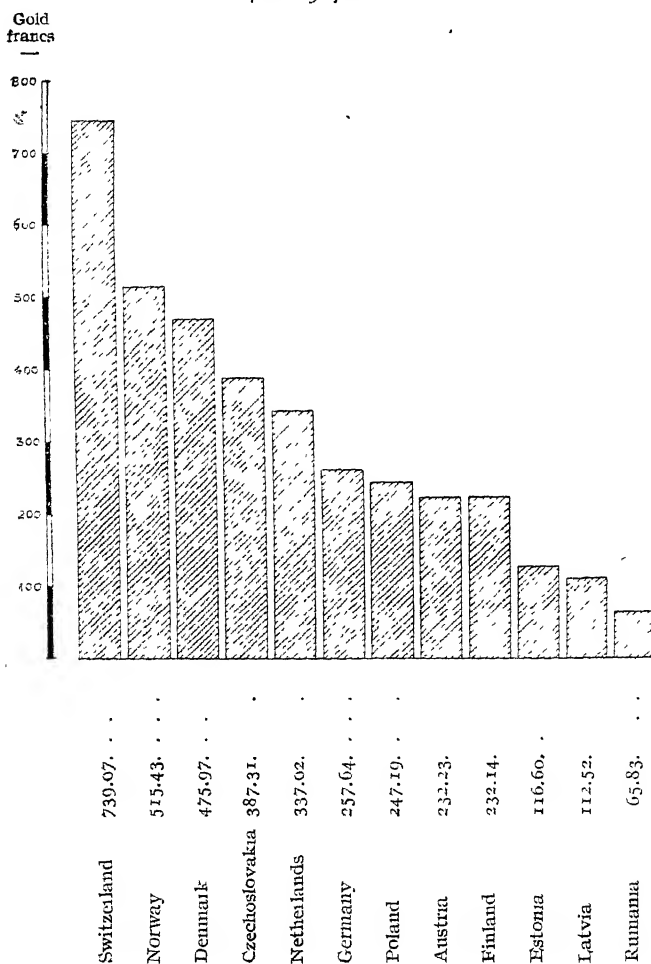
"The smaller the farm", to quote Laur in his "*Économie rurale*", "*the higher per unit of area is the social income*. The more widely is small farming practised, the denser the population that can be maintained by agriculture. It would be an error to suppose that it would be an advantage to the human race if small and medium farming were replaced by a system of large farming enterprises belonging to the State. In certain countries where only the heads of the large enterprises have received a sound vocational training, where the peasants are in a very backward condition or where co-operation is not yet established, it is possible by the system of large farming to obtain a result higher than that of the small farm. But even in these countries as soon as the small farmers have had the opportunity of becoming familiar with progressive methods and as soon as they co-ordinate their efforts by means of co-operation, the system of small and medium farming will show itself superior to that of the large estate. The advantages of small farming from the national point of view are however less in proportion as the regions are less populated and as it seems less practicable to introduce intensive farming systems".

TABLE II. — *Social Income in gold francs per ha. for 1927-1928.*

Country Farms	Region	Number of farms	Average area	Man-days	Social income per ha	Serial order in Recueil
<i>A. Grouping by system of farming and by regions.</i>						
Netherlands:						
grazing farms	Overijssel (IJssel- streek)	16	21.41	50—	316.60	4(a)
grazing farms	Overijssel (Weide- groud)	72	20.86	50—	320.10	3(a)
dairy farms in sandy districts	Overijssel	163	13.12	70—	335.55	7(a)
mixed farms	"	33	16.55	60—	377.10	9(a)
Austria:						
forest predominating	All parts	35	48.30	36.30	149.00	7(a)
alpine stock farming	"	50	31.57	56.10	203.40	3(a)
grass prod. without alpland	"	123	25.13	72.60	274.20	1(a)
" " with alpland	"	24	18.98	85.80	205.80	2(a)
mixed with cereals predominating	"	101	19.61	69.30	351.05	4(a)
" with vinegrowing predominating	"	59	16.70	76—	481.15	3(a)
vine growing	"	5	4.12	208—	724.80	6(a)
Czechoslovakia:						
mixed (cereals and potatoes)	East	3	83.87	39.09	119.40	3(b)
forage crops	West	3	110.65	50.36	214.60	1(b)
mixed (cereals and potatoes)	East	44	17.75	95.10	233.45	4(a)
forage crops	East	5	10.42	107.90	285.25	2(a)
" "	West	30	18.78	93.20	303.85	1(a)
sugarbeet growing	East	3	91.40	82.72	304.15	5(b)
mixed (cereals and potatoes)	West	12	95.40	75.83	239.90	2(b)
sugarbeet growing	East	19	13.13	120.50	383.15	6(a)
mixed (cereals and potatoes)	West	73	17.64	101.50	398.85	3(a)
sugarbeet growing	"	5	119.45	67.91	552.65	4(b)
" "	"	45	19.09	104.30	637.55	5(a)
Finland:						
cattle farming	Ostrobothnie	5	71.43	33.80	173.05	3(b)
" "	South	66	86.34	30—	190.15	1(b)
" "	Centre	4	62.14	37.90	205.65	2(b)
" "	Ostrobothnie	57	13.79	38—	211.15	5(a)
" "	Centre	115	17.92	59.40	250.45	3(a)
" "	South	162	22.51	44.77	277.90	1(a)
" "	South East	54	17.09	51.20	293.95	2(a)
" "	North East	26	13.83	59.70	305.25	4(a)
Rumania:						
cereal growing	Bucarest	3	7.30	—	390.50	2(a)
heavily forested	Dobrudja	30	9.40	—	196.70	3(a)
	—	30	50.90	—	37—	1(a)
Germany:						
cattle farming B	Eastern Prussia	79	416—	—	181.85	3(b)
" " A	" "	117	108	—	185.55	2(b)
forage crops	North	46	421	—	189.25	1(b)
distilling potatoes	Eastern Prussia	25	606	—	197.90	11(b)
forage crops	"	45	33	—	197.90	9(a)
" "	North	49	30	—	206.60	6(a)
" "	"	40	91	—	207.80	7(a)
potato growing	"	16	117	—	211.55	28(a)
raising of slaughter cattle	North-West	29	84	—	212.75	11(a)
distilling potatoes	North	41	601	—	215.20	10(b)
cereal growing	"	90	118	—	222.65	17(a)
" "	"	56	30	—	223.85	16(a)
" "	"	149	462	—	226.35	4(b)
raising of slaughter cattle	North West	80	66	—	241.20	12(a)

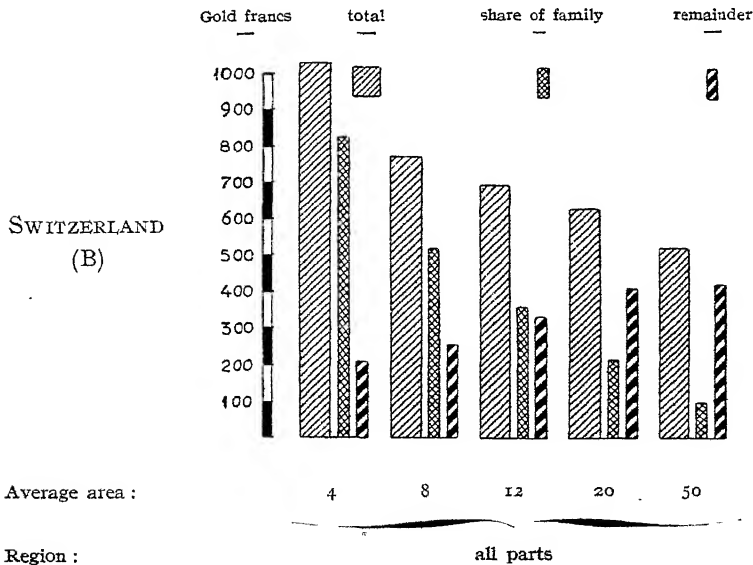
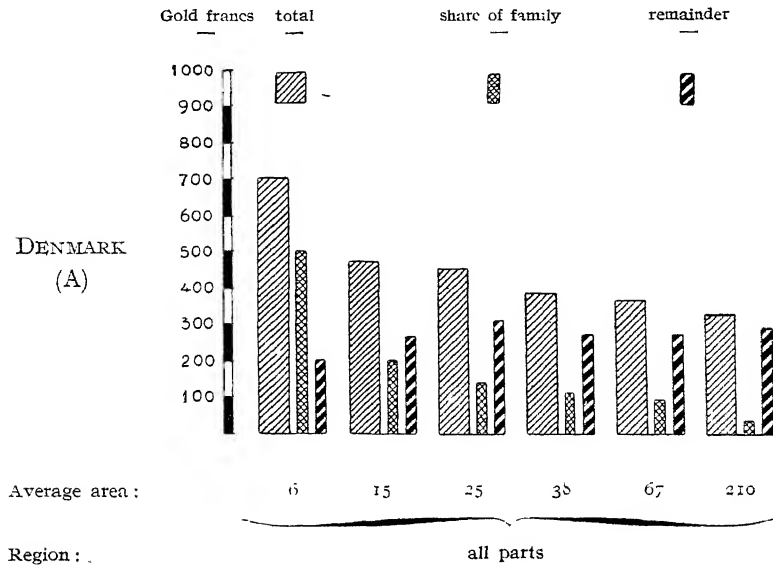
In Graph IX, the countries in which the population is most dense and the degree of intensive farming high, such as Switzerland, Denmark, Czechoslovakia, Netherlands, Germany are placed at the head of the list.

GRAPH IX. — *Social Income per Hectare and by Country in gold francs for 1927-28.*



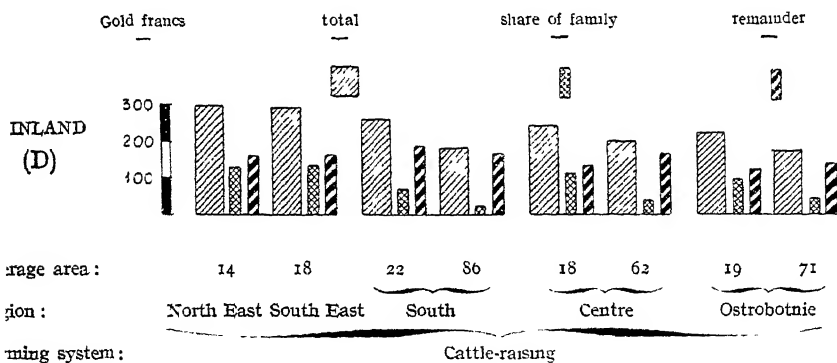
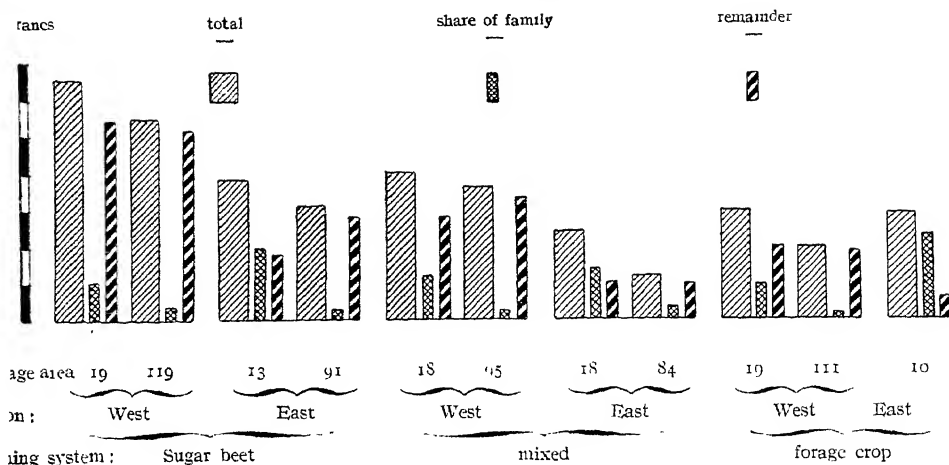
Graphs X (A, B, C, D, E) appear to confirm the law stated by Laur, in accordance with which the social income is affected by the extent of the farms. This phenomenon may be noted alike in countries, such as Switzerland and Denmark, the farms of which are grouped by order of size, and in Czechoslovakia, Finland and Germany which have grouped the farms by farming system, region and by size. As the farm increases in size, the social income rapidly falls. The share going to the family diminishes also rapidly, and beginning from an average area which may be anything between 10 and 20 hectares, the remainder of the social income after subtracting the family share exceeds that share. On the large farms, the family

GRAPH X. — *Social Income per Hectare in gold francs* for 1927-28 [DENMARK (A) ; SWITZERLAND (B) ; CZECHOSLOVAKIA (C) ; FINLAND (D) ; GERMANY (E)].

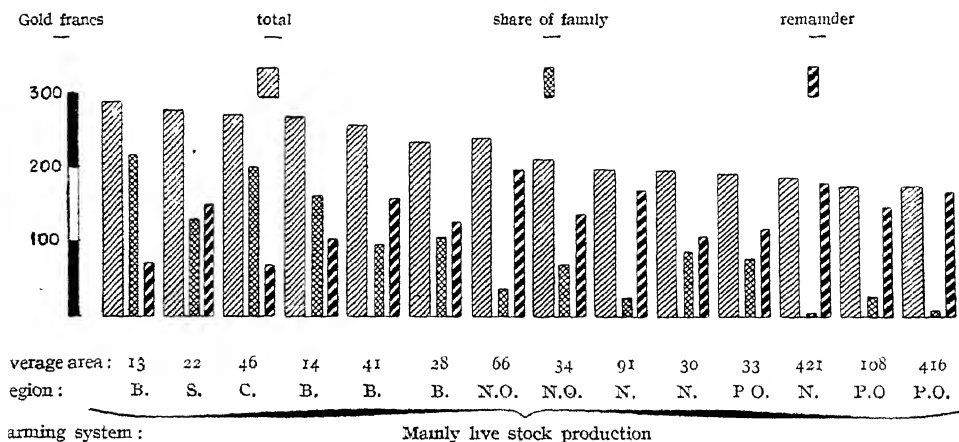


* — Ec. 9 In.

CZECHOSLOVAKIA (C)



GERMANY (E)



B = Bavaria, S = Silesia, N. O. = North-West; N. = North; P. O. = Eastern Prussia.

share is almost nothing in comparison with the rest. As regards Germany, the following figures of Table 12 are taken from Volume 4 of the Report of the Enquiry Committee (*Enquete-Ausschuss*) (1).

TABLE 12. — *Influence of the Size of the Farm on the Social Income in 1924-27 in Germany according to the Enquete-Ausschuss.*

Size-classes	Social income marks	Wages marks	Net Return marks	Taxes marks
EASTERN PRUSSIA				
<i>Forage crop farms.</i>				
10-50	132 30	66.30	51 90	14.10
50-100	126 90	84 70	25.70	16.50
100-200	122 —	95.70	0.50	16.80
200-400	120.10	105.40	—2.50	17.20
above 400	122 50	110.70	—8.20	20 —
CENTRE				
(a) <i>Farms growing sugar beet.</i>				
5-20 . . .	398.10	125.70	210 —	57.40
20-50 . . .	360 80	178 —	225 —	57 80
50-100 . . .	343 —	205 70	81 40	55 90
100-200 . . .	367 70	236 30	73 30	58.10
above 200	346.90	237 60	30 —	59.30
(b) <i>Farm growing cereals.</i>				
5-20 . . .	314.60	117.70	157.80	39.10
20-50 . . .	265 —	141.70	84.20	39.10
50-100 . . .	290.20	163.30	84.70	42.20
100-200 . . .	285.40	225.60	14.90	44.90
200-400	245.60	210.70	—0.60	35.50

"In proportion as the size of the farms increases," to quote the investigators, "there is first noted a decrease in the social income for the medium and large family farms, then an increase for the large farms of the smaller size groups, and finally a decrease again for the very large farms. The larger the farm the more rapidly do the net return and the remuneration of the family labour diminish, owing to the fact that the cost of outside labour absorbs an increasing share of the social income. On the small farms of from 5 to 20 hectares, from one-fourth to one-third of the social income goes into wages; on the large farms of 400 hectares the proportion of the labour costs to the social income amounts to 75 and even 90 per cent. Certain groups show a negative net return; the meaning of this is that the farmer has been obliged to incur debts for the purpose of meeting his obligations". The same tendency appears both for Germany and for other countries on the following table 13 the figures of which are taken from the *Recueil* (page 278):

It is in Germany, even on the small family farms, that wages, and the share of external labour in the social income, are at their highest. Although the total labour costs of the Overijssel (Netherlands) farms are as high as the large farms of

(1) Landwirtschaftliche Buchführungsergebnisse, Untersuchungen zur Lage der Landwirtschaft, Berlin, 1929.

TABLE 13. — *Beneficiaries, in 1927-28, from the Average Social Income in the Majority of Countries shown in the Recueil.*

Country	Number of farms	Average area ha.	Beneficiaries of the Social Income					Total
			Employees	Members	Total	Creditors	State	
			Board	of family	labour	and head	and	
			and wages	Remuneration	Net	of farm	commune	
			%	%	%	%	%	%
Switzerland	500	14.30	31.26	48.05	79.31	16.78	3.91	100
Norway	190	17.26	41.75	39.66	81.41	17.48	1.11	100
Denmark								
small	573	22.65	41.30	37.02	78.32	13.12	8.56	100
large	153	122.49	59.21	16.66	75.87	12.68	10.45	100
medium	726	43.70	51.87	24.99	76.86	13.46	9.68	100
Czechoslovakia								
small	221	17.56	30.55	29.82	60.37	35.65	3.98	100
large	26	99.99	44.37	4.10	48.47	46.49	5.04	100
medium	247	26.25	35.78	20.09	55.87	30.74	4.30	100
Netherlands (Overijssel)	284	15.96	40.55	52.16	92.71	4.82	2.47	100
Germany								
small	1,637	44.25	60.86	24.05	84.91	9.86	5.23	100
large	656	346.89	87.61	4.76	92.37	— 1.76	10.39	100
medium	2,293	130.81	81.14	9.43	90.57	0.29	9.14	100
Poland	804	13.64	20.75	29.74	50.49	47.36	2.15	100
Austria	427	30.46	31.09	37.78	68.87	26.84	4.29	100
Finland								
small	414	10.59	34.27	39.76	74.03	25.97	—	100
large	75	84.06	62.17	11.83	74.00	26. —	—	100
medium	489	29.48	46.47	27.54	74.01	25.99	—	100
Estonia	250	41.84	27.44	53.58	81.02	16.70	2.28	100
Latvia	117	45.37	41.63	39.26	80.89	16.49	2.62	100
Rumania	63	29.06	11.58	22.49	34.07	59.19	6.14	100

Germany, the share falling to the wages of employees does not exceed the average level of other countries, and it is the share representing the remuneration of the work of the family (52.16 per cent.) which predominates. On Table 13 as on Table 12, "the net return and the remuneration of the work of the family decrease as the farm increases in size", except in Czechoslovakia, where the net return is higher on the large farms than on the small farms. In contrast to Germany, elsewhere on the small farms, in Poland and Rumania for example, the net return is high in proportion to the labour expenses.

If all the countries do not exhibit this tendency with equal clearness, it is because on the other hand when the farming is intensive it requires the more labour and it appears that labour costs are highest in those countries in which, so far as can be judged, agriculture is most intensive.

In regard to taxation, the proportion in the social income varies in the majority of countries between 2 and 5 per cent.; in Rumania it is 6 per cent., in Germany and in Denmark from 9 to 10 per cent. Table 14 shows what is the proportion, according to the Enquete-Ausschuss, in which taxation has increased in Germany from 1912-14 to 1924-26:

The conclusion is found on page 217 of the fourth volume of the *Enquête-Ausschuss* and is as follows: "Taxes are from three to five times higher in 1924-26 than in 1912-14. The rate of taxation has gone up more markedly in the Centre than in the East. In relation to the net return, the more intensive the farming the larger is the increase in taxation. In the groups of farms growing cereals in the East and of forage crop farms in the East and Centre, the taxes are higher than the net return".

TABLE 14. — *Taxes and other Charges on the Farm in two Regions of Germany in 1912-14 and 1924-26 in RM.*

Farming systems	Farming year	Number of farms	Taxes and other charges marks	Net return marks	Taxes and charges in %		
					of net return %	of gross return %	of farming expenses %
EAST.							
A a	1912-14	44	9	140	6.50	1.60	2.10
	1924-26	44	33	42	78.60	5.50	3.60
B a	1912-14	45	6	75	8.00	1.60	1.90
	1924-26	45	25	2	1,250.00	6.80	6.40
C a	1912-14	44	6	37	16.30	2.30	2.60
	1924-26	44	18	-19	—	6.80	6.00
CENTRE.							
A b	1912-14	59	9	164	5.50	1.20	1.50
	1924-26	59	43	90	47.80	5.70	6.20
B b	1912-14	20	8	100	8.00	1.60	1.90
	1924-26	20	32	38	84.30	6.00	6.10
C b	1912-14	20	8	48	18.70	1.80	2.00
	1924-26	20	27	-5	—	6.90	6.40
(1) A = farms growing sugarbeet B = farms growing cereals. C = " " forage crops a = more than 100 ha. b = more than 50 ha.							

In the following Table 15 is set out the social income obtained per hectare of area and per man-day on the peasant or family farms and on the large farms of the *Recueil* :

TABLE 15. — *Social Income General Averages of the Countries in gold francs per hectare in 1927-28.*

Countries	Peasant or Family Farms					Large Farms.				
	Number of farms	Average area ha.	Man-day per ha.	Social income		Number of farms	Average area ha.	Man-day per ha.	Social income	
				per ha	per man-day				per ha.	per man-day
Switzerland	500	14.30	75—	739.07	9.85	—	—	—	—	—
Norway	190	17.26	40.55	515.43	12.71	—	—	—	—	—
Denmark	573	22.65	41.09	448.92	10.92	153	122.43	31.66	345.15	10.91
Czechoslovakia	221	17.56	100.94	402.07	3.98	26	99.99	67.93	385.23	5.38
Germany	1,637	44.25	—	305.67	—	656	345.89	—	242.31	—
Austria	397	24.66	64.25	280.90	4.37	—	—	—	—	—
Finland	414	19.59	48.95	265.08	5.42	75	84.06	30.50	189.77	6.22
Poland	804	13.64	66.61	247.19	3.71	—	—	—	—	—
Estonia	250	41.84	26.60	116.50	4.38	—	—	—	—	—
Latvia	117	45.57	25.50	112.52	4.41	—	—	—	—	—
Rumania	63	29.06	—	65.83	—	—	—	—	—	—

GRAPH XI. — *Man-days per Hectare for 1927-28* [(DENMARK (A)) ;
SWITZERLAND (B) ; CZECHOSLOVAKIA (C) ; FINLAND (D)].

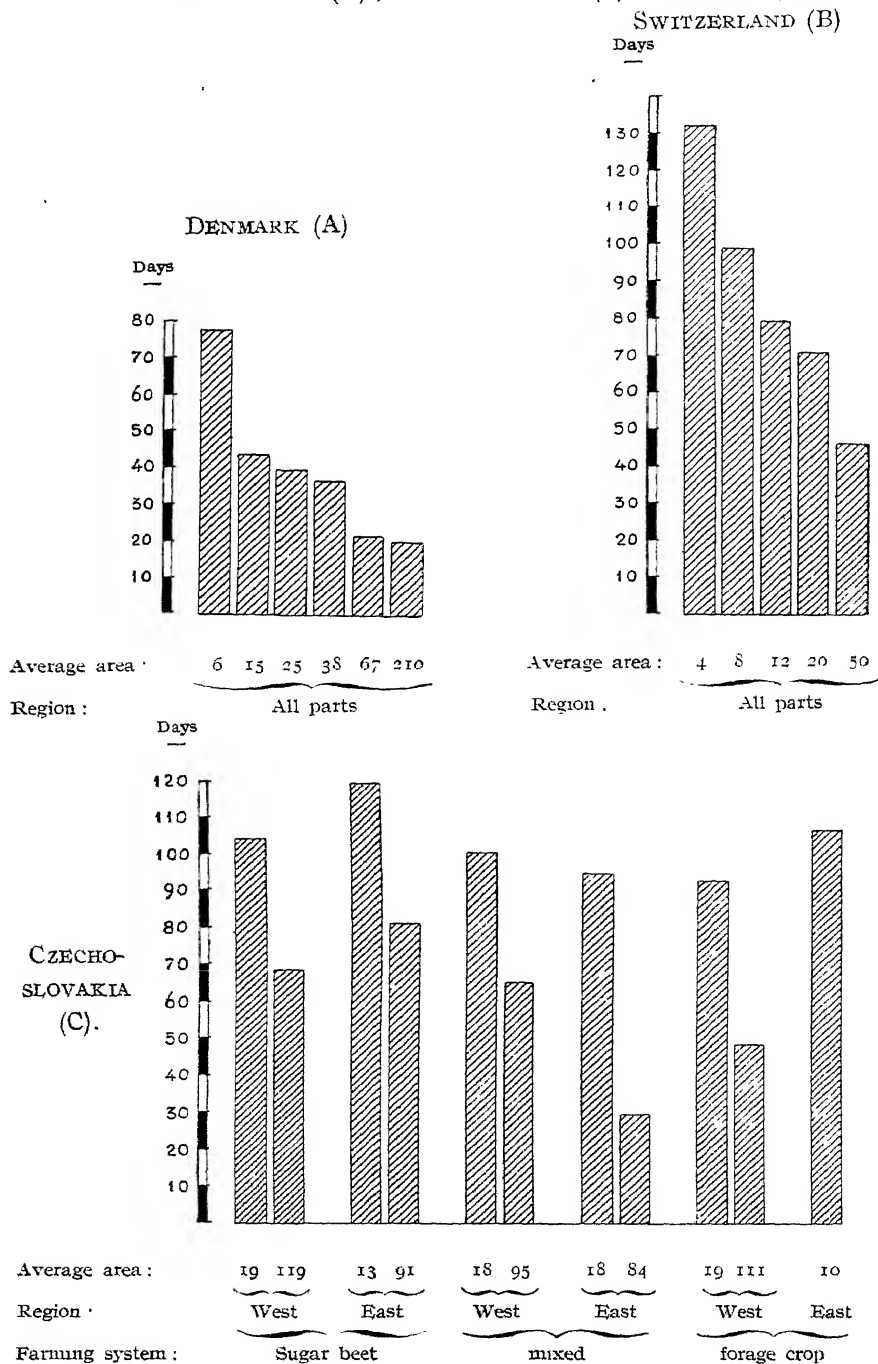


TABLE 16. — *Expenditure on Labour.*

Countries	Average area	Man-days		Labour costs					Farming expenses.		External Labour		Labour — % of farming expenses
		per ha.	Index no.	employees per ha.	Index no.	family per ha.	Index no.	total	Index no.	per ha.	index no.		
a) Peasant Farms.													
Switzerland	14.30	15—	159.1	231.03	205.2	355.11	292.2	586.14	270.4	1095.60	239.1	39.41	53.50
Denmark	22.05	41.00	87.1	185.41	164.7	166.10	135.7	351.80	150.2	951.44	207.6	52.73	36.95
Norway	17.26	40.55	86—	216.15	191.1	204.38	168.2	419.53	179.2	802.12	188.2	51.28	48.66
Sweden	11.35	—	—	119.53	106.2	149.39	122.9	268.92	114.9	451.02	98.4	44.45	59.62
Germany	14.25	—	—	186.02	165.3	73.50	60.5	259.52	110.9	545.29	119—	71.67	57.54
Finland	19.59	48.95	102.8	90.87	80.7	105.40	86.7	196.27	83.8	392.64	72.6	46.30	59—
Poland	13.64	66.61	141.3	51.29	45.5	73.51	60.5	124.80	53.3	224.08	48.9	41.10	55.69
Austria	30.46	52.80	172—	72.19	64.1	87.73	72.2	159.92	68.3	252.28	51.1	45.14	63.38
Estonia	41.84	20.00	56.4	32—	49.8	62.47	51.4	94.47	40.4	148.09	32.4	33.87	63.54
Latvia	45.57	25.50	54.1	46.84	41.6	44.17	36.3	91.01	33.9	137.55	30.0	51.47	66.17
Rumania	20.06	—	—	7.62	6.8	14.80	12.2	22.42	9.6	38.75	8.4	33.99	57.85
Average		17.14	100—	112.54	100—	121.51	100—	234.05	100—	458.14	100—	46.49	56.53
b) Large Farms.													
Denmark	122.49	31.66	—	204.36	—	57.51	—	261.87	—	674.26	—	78.04	38.84
Germany	346.80	—	—	212.30	—	11.54	—	223.84	—	484.77	—	94.84	46.17
Finland	84.06	30.50	—	118.02	—	22.48	—	140.50	—	278.36	—	84—	50.47
Sweden	199.70	—	—	242.78	—	6.17	—	248.95	—	534—	—	97.52	46.62
c) Small and large farms.													
Germany	130.54	—	—	205.94	—	26.53	—	232.47	—	499.41	—	88.58	46.55
Finland	29.47	40.88	—	102.74	—	69.13	—	171.87	—	308.90	—	59.77	55.64
Sweden	60.87	—	—	226.01	—	25.86	—	251.87	—	521.83	—	80.73	48.27

ably lies in a careful and systematic planning of the work". The larger the farm the lower is the remuneration of the family, while the cost of external labour increases, up to the point of representing on the large farms, from 70 to 90 per cent. of the total labour costs.

The labour costs of the peasant or family farms of all countries represent 60 per cent. about of the farming expenses, while on the large farms this figure drops to 40 to 50 per cent., a fact which seems to prove, as does the graph of the days of work, that the small farm gives work to a larger number and also feeds a larger number than does the large farm. Hence it is possible to say with Prof. Laur (1), that "the more widely is small farming practised, the denser is the population that can be maintained by agriculture".

Summarising, the results, incomplete as they are, relating to social income and the figures concerning farm labour convey some idea of the importance that will attach to them at the end of a period of a certain number of years, when, completed by similar results from other sources, they will be of assistance in solving the very real problems of the agrarian reform.

(f) *The Proceeds of Work.*

The family farms represent an investment rather of the work of the farmer and his family than of capital. The proceeds of work, or wage that remains to the farmer, when he has deducted from the agricultural income of his farm the interest on his own capital, is of more direct interest to him than the net return. It is for this reason that under this heading of proceeds of work, only the family farms are taken into consideration. The proceeds of work per man-day for Denmark and Germany has been calculated on the basis of all the days of work. The peasant or family farm being by definition a farm providing occupation for the whole of the year for the farmer and his family, in these calculations the family is taken to include the servants who are as a rule only engaged on the family farm when the number of the members of the family is below the normal level.

If the figures were available, it would be of great interest to compare the proceeds of work with the remuneration to which the farmer and his family are entitled viz., the sum included in the farming expenses and reckoned on the basis of a farm servant's wages.

For the family farms of two countries the results of such a comparison are as follows:

Country	Fair wage claim per ha.	Proceeds of work per ha.
	gold francs	gold francs
Denmark	167.35	67.58
Switzerland	281.00	161.28

On Table 17 the results for Denmark and Switzerland show the same tendency: the farmer's work secures the highest remuneration on the small peasant or family farms. In Switzerland, however, the farms of from 5 to 15 hectares

(1) *Économie rurale*, p. 456.

** — *Lc. 9 Ing.*

TABLE 17. — *Proceeds of Work on Peasant Farms in gold francs per Man-day in 1927-28.*

Country Farms	Region	Number of farms	Average area	Man-days per ha.	Proceeds of work per man-day	Wage of a rural worker	No. in the Recueil
Netherlands:							
mixed farms	Overijssel	33	16.55	60—	3.35	5.20	9(a)
dairy	Overijssel (Werdgrond)	72	20.86	50—	1.91	5.20	3(a)
grazing farms	Overijssel (Ijsselstreek)	16	21.41	50—	1.67	5.20	4(a)
"	Overijssel	163	13.12	70—	2.79	5.20	7(a)
all the above farms	"	284	15.96	60—	2.52	5.20	17(a)
Denmark:							
from 30 to 50 ha	all parts	183	38.10	36.60	0.61	8.76	4(a)
" 20 to 30 ha	"	140	25—	40.20	1.72	8.70	3(a)
" 10 to 20 ha	"	109	15.50	44.50	2.65	8.42	2(a)
under 10 ha	"	141	5.80	77.30	4.43	7.70	1(a)
all the above farms	"	573	22.65	41.00	1.64	8.28	(1)
Germany:							
mixed (unfavourable situation)	Württemberg	38	48—	68—	-0.24	4.33	13(a)
" (medium situation)	"	51	57—	68.31	+0.07	4.53	14(a)
" (favourable situation)	"	18	42—	99.30	+0.98	4.85	15(a)
all the above farms	"	107	51.28	58.38	0.66	4.46	—
Switzerland:							
from 20 to 100 ha.	all parts	32	50.40	46—	1.90	8—	1(b)
" 15 to 30 ha	"	123	20.49	70—	2.80	6.70	14(a)
up to 5 ha.	"	48	8.76	133—	2.93	6.96	11(a)
from 5 to 10 ha.	"	182	7.68	101—	3.23	6.47	12(a)
" 10 to 15 ha	"	115	12.50	81—	3.43	6.47	13(a)
all the above farms	"	500	14.30	75—	2.87	6.66	15(a)
Czechoslovakia:							
mixed farms	East	44	17.75	95.10	0.70	2.07	4(a)
"	"	5	10.42	107.00	0.80	2.32	2(a)
forage crop	West	30	18.78	93.20	1.40	2.24	1(a)
sugarbeet growing	East	19	13.13	120.50	1.70	2.24	6(a)
mixed	West	78	17.64	101.50	3.10	2.44	3(a)
sugarbeet growing	"	45	19.09	104.30	5.30	2.76	5(a)
all the above farms	all parts	221	17.56	100.94	1.91	2.40	(1)
Poland:							
all the above farms	South	255	8.80	95.38	0.73	1.51	1(a)
"	East	135	19.51	41—	1.68	1.92	2(a)
"	Centre	293	13.33	68.78	2.26	2.02	3(a)
"	West	121	18.05	64—	2.93	2.10	4(a)
"	all parts	804	15.64	66.61	1.94	1.81	(1)
Latvia:							
all farms	all parts	117	45.57	25.50	1.09	1.57	1(a)
Estonia:							
all farms	all parts	250	41.84	26.60	2.11	1.55	1(a)
Finland:							
cattle raising	North-east	26	13.83	59.70	2.48	3.92	4(a)
"	Ostrobothnia	57	18.79	38—	2.61	4.13	5(a)
"	Centre	115	17.92	59.40	2.74	3.83	3(a)
"	South	162	22.51	44.77	3.40	4.08	1(a)
"	South-east	54	17.99	51.20	4.44	4.15	2(a)
"	all parts	414	19.79	48.95	3.12	4—	6(a)
Norway:							
all farms	all parts	190	17.26	40.55	5.43	7.99	1(a)

(1) See: Table of averages.

have given more favourable results than the farms of less than 5 hectares, these latter being too small to provide sufficient occupation for the farmer.

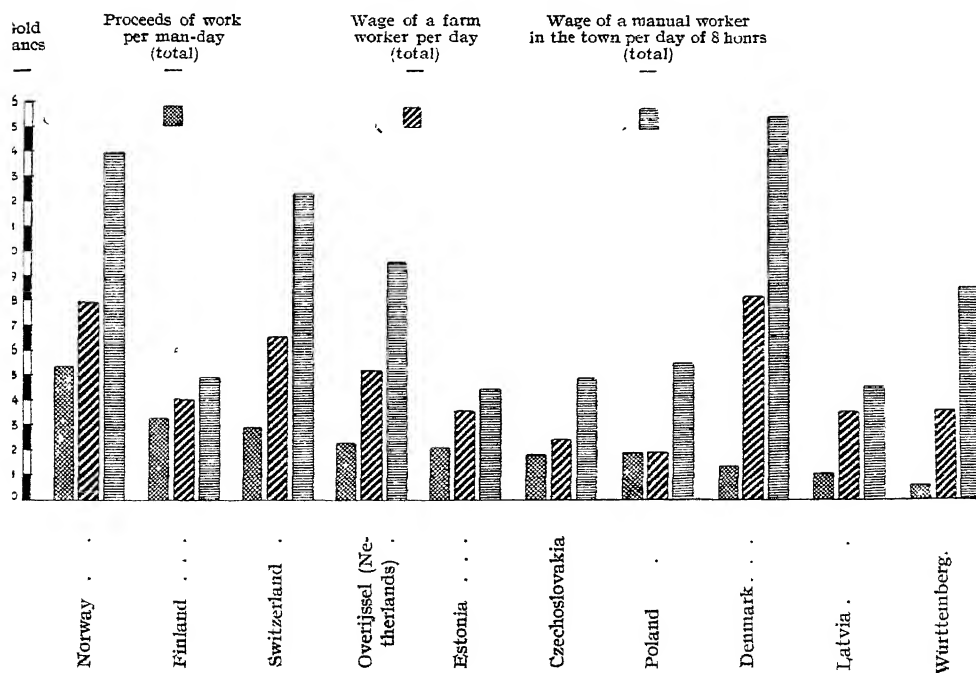
The farms of other countries where the difference between the areas is not of importance are not grouped in order of size, and it is primarily the influence of the systems of cultivation and of regions which has brought about variations in the proceeds of work.

TABLE 18. — *Proceeds of Work and Wages of Farm Workers and of Town Workers (Manual Worker) per Day's Work in gold francs.*

Country	Proceeds of work of farmer per man-day	Wages of a rural worker (1) per man-day	Wages of a town worker (manual) in 1926 per day of 8 hours
Norway	5.43	7.99	13.97
Finland	3.21	4. —	(2) 4.70—5. —
Switzerland	2.87	6.66	(3) 12—14
Netherlands	2.52	5.20	9.76
Estonia	2.11	3.55	4.48
Czechoslovakia	1.94	2.40	4.88
Poland	1.94	1.81	5.60
Denmark	1.42	8.28	15.48
Latvia	1.09	3.57	4.55
Wurttemberg	0.06	4.46	(4) 8.64

(1) including wages in kind — (2) apprenticed in 1927. — (3) in 1923. — (4) Berlin.

GRAPH XII. — *Comparison between the Proceeds of the Farmer's Work and the Wages of Farm and Town Workers in 1927-28.*



In the Netherlands, the mixed farms of Overijssel do better than the dairy farms and these latter than the grazing farms of the same region. In Czechoslovakia, the farms of the West do better than those of the East. In Poland the results of the West and Centre are nearly twice as high as those of the East and South. In the southern regions of Finland the cultivator secures a much better remuneration than in the regions of the Centre or the North.

Table 18 and Graph XII can do no more than form a basis for a really strict comparison of the average results of the countries under review. The proceeds of work are obtained by deducting from agricultural income the interest on the own capital invested. The Accountancy Offices have adopted greatly differing rates, and in consequence the averages of the proceeds of work are not directly comparable. On the other hand, there are divergences in the calculation of the working day of the agricultural worker, as stated under the previous heading. In addition purchasing power must be taken into account. It is however possible to place side by side with the proceeds of the work of the farmer the wage of the workers he engages and that of the manual workers in the nearest town, so long as only one country is considered at a time. Except in Poland, in Czechoslovakia and in Finland where small differences are noted, the earnings of the town worker are practically double those of the farm servant and four times that of the farmer.

(to be continued).

J. DESLARZES.

Effects of the Agricultural Crisis on the Family Farm in Hungary.

In present day Hungary the number of small holdings from 0 to 100 *holds* (1 hold = kat. Joch = 0.5754642 ha. — about 1.3 acres) stands at about 840,000. This class of property represents 8,110,000 holds out of a total agricultural area of 16,148,100 holds. Out of the most important branches of production, 63 per cent. of arable land, 65 per cent. of wheat cultivation and 80 per cent. of stock farming are in the hands of the small holders.

These figures give a clear indication of the economic policy which should be followed by Hungary in the future. The aim should be that of improving and increasing the production of small rural holdings, or in other words of raising the intellectual level of this important social class.

Owing to present conditions of trade and transport very close economic relations are set up between regions lying at considerable distances apart, and in consequence the present crisis makes itself felt over a much wider area than did similar crises in former times.

Apart from the world economic crisis, there is another economic crisis to be taken into account, that which is specially affecting Hungary. This crisis is due to the fact that the economic organisation and the agricultural production of the country represent a mere fragment of the large unit of production that was pre-war Hungary. The progress made in pre-war production was accomplished within the limits of the former customs frontiers. The monarchy of Austria-Hungary formed, from the industrial as well as the agricultural standpoint, a large producing and consuming unit. With the growing density of population, the spread of industrialisation and the higher earning capacity, the absorption power of the internal markets also became greater and it was taken for granted that all the farmer

had to do was to give attention to increasing his production. It was never imagined that as compared with production the question of marketing could assume an importance such as to make it one of the main causes of the world crisis.

The economic conditions of the war and subsequent failure of resources, the impossibility of ensuring maintenance of capital and of making new investments of capital in production, have reduced the gross return by from 15 to 30 per cent. in all branches of industry and agriculture. The great disparity between the prices of products and those of requisites has on the other hand led to an increase in costs of production also to the extent of from 15 to 30 per cent., so that the net return has shown a very marked decline. In consequence the average return from agriculture, which was before the war from 6 to 8 per cent., fell to about 2 to 3 per cent. During the inflation period which followed, investments of capital were directed towards those estates which promised immediate results. At the time of stabilisation, Hungarian agriculture was accordingly in a very unfavourable position.

It is not within the scope of this article to investigate the causes of the present crisis ; it should however be observed that, on consequence of the circumstances indicated, there is an obvious organic relation between the economic decadence of the war period, on the one hand, and on the other, the present economic crisis.

The present day crisis in agriculture is characterised in the first place by the relatively high cost prices as well as by the low selling prices and the difficulties of marketing.

The products most easy to transport, viz., the cereals, are affected by the keen competition of other grain producing countries. This competition can be met only by endeavouring to produce a product of first class quality and at a lower cost price.

To achieve this object, agricultural production in Hungary will have to undergo certain modifications with the result that only those branches of production will be developed as are indicated by the climate, the soil and the position of the markets. There is in fact no other method of reaching the desired result.

Progress along these lines may already be observed ; but is hindered or delayed by the difficult conditions of credit. In consequence of world economic competition there is a certain tendency to substitute potatoes, turnips or forage crops for wheat. Attention should also be paid to the encouragement of rural industry and of live stock farming taking into account the somewhat arid conditions of the country, the situation of Hungarian markets in relation to world economy, as well as the density of population which is fairly considerable. The increasing effects of the crisis appears in the growing disparity between the prices of products and the means of production. The index of agricultural products is, on the 1913 basis, 82, while that of manufactured products is 124.

The position is rendered still more serious by the uncertainty in sales, due to the increasing world competition in the production of wheat. In fact only those wheat provinces of Hungary can meet this competition in which soil and climate are favourable to the production of a wheat of high quality and good yield. It is only on these conditions that the cost price can be reduced and the investment secured. In this respect success has already been achieved in several localities, and that the ability to compete is primarily a question of quality and production costs is doubly proved by the fact that other provinces with a poorer quality of wheat and a lower yield have failed to compete at the low prices now prevailing. Such localities should give a new direction to their production. According to their soil and climate they may be successful in live stock farming based on forage crop production of varying kinds, or in rural industry.

Hence, under the influence of a frenzied market competition, a forced reorganisation of agricultural production in Hungary is in progress

The development of live stock farming and of rural industries involves an intensification of production ; the question thus becomes one of finding the funds for carrying out these changes. These funds must be assured to agriculture under the form of long term credits ; for in view of the general decrease in returns, agriculture cannot obtain this credit on the ordinary market under the form of short term credits.

The problem presents great difficulties for the whole business of agriculture lies in adaptation to the present price situation and marketing conditions, If this is not effected then serious losses are inevitable, and numerous possibilities of profit are missed. In short, the solution of the problem of the agricultural crisis in Hungary presents difficulties of an exceptionally serious character.

It is however possible to observe considerable progress in the development of live stock farming as well as in rural industries. Stock breeding societies are in fact in Hungary models of organisation. As an example, the Society of Cattle Breeders of the Department of Feher has, in a period of ten years, 1920-21 to 1929-30, raised the number of tested cows from 1053 to 4099, the milk yield per head rising from 1743 to 3671 litres and the butter fat yield from 68 kilogrammes to 137. Similar progress has been accomplished in the subsidiary branches, such as that of pig breeding. The Live Stock Fair and the Exhibition of Breeding Animals of this year has been proof of the advances made by the class of small holders and on the other hand of the breeding of Yorkshire pigs. Such a direction to Hungarian agriculture is made necessary by the competition on the wheat market, the unfavourable position of the market in other products and the density of population.

The rapid development of the crisis makes it however impossible to accomplish in an orderly manner this process of modification and improvement. Much more rapid progress in this economic reorganisation would be necessary if wheat, from which returns are at present so uncertain, is to be replaced by more productive branches of farming. In view, however, of the present situation in regard to income obtained to capital and to credit, too much must not be anticipated in this respect. On the other hand hopes may be entertained of a possible international solution of the wheat problem facilitating real progress which cannot but be slow, and making available the financial means required for placing the agriculture of the country on a basis better adapted to present circumstances.

In connection with this development, several important questions arise, and in the first place the problem of credit and the question of co-operation.

The small holders have been very seriously affected by the world crisis, and the indebtedness of this class calls for special attention.

The figures given below are clear testimony to the effect of the meagre credit available and of the want of confidence. They throw light upon the hardships of an industrious peasantry who, owing to present economic conditions have to pay heavily for the smallest advances, while on the other hand, the gold withdrawn from economic circulation remains in reserve in the bank coffers. The credit question is in fact the true centre of all our troubles. The losses resulting therefrom powerfully affect Hungarian agriculture.

Short term credit which is easily recoverable is very difficult to obtain, a fact which renders all normal economic progress impossible, paralyses all efforts to increase returns and destroys the capacity to maintain the struggle against world competition.

Agricultural competition has been so much increased by the world crisis that it become impossible to meet except by a supply of products of first class quality at low net costs, a combination exceedingly difficult to ensure. At the same time there is no method more certain of arriving at a solution of present day problems.

The essential condition for such a solution is a more intensive organisation of agricultural production, requiring the investment in farming of large capital sums. In its turn, this investment can only take place if the problem of agricultural credit finds adequate solution.

Rate of interest forms part of production costs. The lower that rate, the lower is the net cost and the greater is the competition capacity of the product. Production of standard commodities of first quality is only a partial solution of the difficult problem of the marketing of products. The question of net cost still remains to be solved and its solution depends on the previous solution of the credit problem.

Indebtedness of Small Holdings in Transdanubian Hungary.

Class of holdings or "holds" . Number of holdings . .	5-10 4	10-20 6	20-30 9	30-40 3	40-50 3	50-100 2	Average 5-100 27
	Pengő						
Charges per "hold" :							
Mortgages	161.76	13.74	69.02	12.29	60.13	—	58.07
Other loans on interest .	118.02	69.13	33.40	50.65	22.38	57.85	56.38
Total charges per "hold" .	279.78	82.87	102.42	62.94	82.51	57.85	114.45
Total charges per 100 P. of farm capital	10.87	3.71	5.91	4.56	2.76	3.98	5.51
Mortgages per 100 P. of capital . .	7.75	0.60	4.89	1.45	3.93	—	3.51
Percentage of the total of the charges due on the mortgage debts . .	57.32 %	16.58	67.39 %	19.53 %	72.87 %	—	44.98 %

The debts of 27 holdings have been also examined. They fall into three groups : mortgage debts, other borrowings at interest and bills. Invoices and arrears of taxation are omitted.

	Average	Range
Mortgage loans	9.4 per cent.	4 to 13 per cent.
Other loans at interest	10.5 " "	9 " 15 " "
Bills	13.0 " "	11 " 16 " "

The indebtedness in relation to the area is not extremely high but none the less the difference between it constitutes a heavy burden. The reason is that the interest paid for the loan and the actual interest is enormous. In 1929, the net return on a average of these 27 holdings was 1.25 per cent. ; it has now fallen to 0.19. This net return represents the interest on production at the present time. In other words, the small holder is paying for his borrowing an average of 11 per cent., while in 1929 all he could make from his crops, etc. was 1.25 per cent. The difference is thus 9.75 per cent. This figure shows clearly the gravity of the situation of the holdings burdened with debts, and 60 per cent. of the holdings under consideration are more or less so burdened. All this shows the immense importance of a satisfactory and rapid solution of the credit problem.

If this 10 to 16 per cent. interest which the Hungarian small holder has to pay is compared with the minimum rate of interest in the Western countries, it will be seen that he cannot hold his own against the competition. If it is desired to assist Hungarian agriculture to to any serious extent, a satisfactory organisation of long term credit must be carried out.

The Hungarian co-operative societies, which had made an excellent beginning as organisations for sale of produce and purchase of requisites and also as credit organisations, suffered severely from the war, and in particular from the shortage of capital, the depreciation of the currency and the restrictions imposed during the war on the economic life of the country. For the restoration of their activities the chief requisites are confidence and capital. Another prerequisite is the economic consolidation of the farms; for this purpose the necessary capital must be obtained by long term foreign loans, by export credits and by building up of capital resources in the country.

With a view to popularising the idea of co-operation in Hungary, the Central Office of Farm Accountancy is collecting exact price statistics with the help of farmers. The object is to enable the Office to compare prices received by small holders, by the large estates and the prices paid by consumers.

In this way very valuable material is obtained on actual conditions which illustrate the advantages of co-operative societies, and may be regarded as among the best means for combatting the crisis from which agriculture is suffering. The prices obtained by the small holders and these obtained by the large farms, in other words by vendors of products in small quantities or in bulk, are in the following ratios for the most important commodities: the retail prices are lower by 8 per cent. for wheat, from 20 to 30 per cent. for milk, by 19 per cent. for cows culled for slaughter, 7 per cent. for part fattened oxen, 19 per cent. for slaughter calves, 11 per cent. for fattened pigs, 30 per cent. for lean pigs, from 36 to 56 per cent. for poultry, in comparison with the prices obtained when the quantities sold are large. As regards prices of manufactured goods, the small holder has to pay from 15 to 40 per cent. more than the large producer.

Some tables are given below illustrating the effect of the crisis on the small farms, based on the average results of 28 farms in the Transdanubian portion of Hungary. In order not to render the tables too complicated, averages for all holdings of from 5 to 100 holds are taken.

Gross Return in pengös per "Hold" of Cultivated Land, and the Percentage Distribution of this Return.

Farming area.		Transdanubia					
Number of farms reviewed		28					
Class of "hold"		5 to 100 ha.					
Year	1928		1929		1930		
	P.	%	P.	%	P.	%	
Increase of supplies	10.71	3.77	9.31	3.97	8.47	4.06	
Various branches of farming							
" grain	83.55	29.35	64.27	27.89	44.90	21.15	
" other arable crops.	9.09	3.20	10.15	4.32	7.10	3.41	
" vegetables, fruits	52.08	18.25	24.18	10.22	30.84	19.11	
" stock farming	122.30	42.95	119.90	51.08	101.92	48.88	
Miscellaneous	7.08	2.48	7.08	3.02	7.08	3.39	
	284.81	100.00	234.89	100.00	209.40	100.00	

Production Costs in pengös per "Hold" of Cultivated Land and Percentage Distribution of Costs.

Farming territory		Transdanubia					
Number of holdings examined		28					
Size group of holdings		5 - 100					
Year	1928		1929		1930		
	P.	%	P.	%	P.	%	
Amortisations	17.50	5.73	16.08	5.28	15.80	5.31	
Diminution of stocks expenses	15.66	5.13	24.86	8.17	24.86	8.35	
Farming	49—	16.04	46.23	15.19	41.60	13.97	
Labour costs.	128.36	42.03	124.63	40.32	123.88	41.44	
Total farming expenses	210.52	68.93	211.80	69.56	205.64	69.07	
Interest on total assets	94.83	31.07	92.75	30.44	92.04	30.93	
Total of production costs	305.35	100.00	304.55	100.00	297.68	100.00	

The gross return has been calculated by adding the returns in cash of the holding, the receipts in cash of the farming, the increase in inventory values and payments in kind to workers, deducting from the total sum the amortisations, cash expenditure for the farming and the contributions in kind from outside.

The main items of the gross return will be singled out so as to show those branches most markedly influenced by the price fluctuations.

Under the heading "grain production" is understood mainly wheat and some rye in the territories under review. Other cereals are utilised mainly in stock farming and enter under that head into the final gross return.

The special pressure of the agricultural crisis as regards the small rural holdings began in 1928 and continued over the following years, bringing about in the case of certain farm products a severe fall of prices. The cereals index shows the sharpest fall, that of rye being sharper than that of wheat. According to the lists of the Hungarian Bureau of Statistics, the cereal price index fell, taking that of 1913 as the base, in June 1930 to 80 for wheat, to 49 for rye, 76 for barley and 65 for oats. According to the observations of the writer, wheat was sold in June 1928 at 34 pengös, in June 1929 at 23 pengös, in December 1930 at 14 pengös. Rye is sold in June 1928 at 33 pengös, in December 1930 at only 9 pengös.

In respect of live stock, with the exception of pigs, price fluctuation is much less marked. Milk and egg prices have remained steady.

The prices of manufactured products have also fallen, but in comparison with farm products the decline has been much less. There is even a disproportion of from 25 to 30 per cent. between the index of agricultural and that of manufactured products, to the disadvantage of the former. In other words, the small holder has been obliged to sell, during the years 1927-30, an increasing quantity of farm products so as to be able to purchase the same quantity of the means of production. Naturally the charges have differed very much according to the type of production on the small holdings, and it is these differences which have influenced in various ways the prosperity of the individual holdings, but the figures available are insufficient to allow of general conclusions. It has in fact proved impossible to establish statistics in this respect, and the Central Farm Accountancy Bureau has therefore been unable to meet the request of the International Institute of Agriculture

for such material. The number of closures of accounts will be trebled at the end of this year and later investigations will accordingly be facilitated.

The continual decline of the prices of agricultural products as compared with the prices of manufactured goods and other production costs had a depressing effect on the small farm holdings. During the three years under consideration, the gross return per "hold" has fallen from 285 pengös to 209, *i. e.*, by 27 per cent. Out of the total decline of gross return, 47 per cent. relates to cereals, 36 per cent. to other crops and 17 to live stock. As regards live stock, pig production shows a considerable price fall, prices of cattle vary somewhat indefinitely; the price of poultry remains fairly steady.

Farming expenses representing the sum of current expenses, diminution in stocks, decrease in field inventory, wages and the fair wage claim of the farmer, show no changes of note. The greater part of the total production costs consists in the labour cost and the interest on the total assets. Of the labour costs 74 per cent. consist in the fair remuneration of the farmer and his family, while 26 per cent. consist in the expenses of board for workers, wages and other forms of remuneration. The first part of these expenses shows little change over the years examined. As regards the second part, wages in cash remain fairly constant, while the part paid in kind shows a tendency to diminish. As a whole the labour costs tend to decline.

As regards farming expenses, the part which consists of actual outgoings shows a decrease of 15 per cent. Since however on small holdings this part is relatively small, on the whole farming expenses there is no important difference. The ratio of the farming expenses to the gross return is expressed by the series of percentages, 73.92, 90.17 and 98.20.

While the gross return has fallen by 27 per cent., the farming expenses as well as the total cost of production show a fall of 3 per cent. only. Accordingly there is an increasingly unfavourable depression to be noted in the various factors making up the net return reducing it from 75.51 pengös per hold in 1928 to 23.09 pengös in 1929 and to 3.48 pengös in 1930, the reduction thus being in relation to the assets from 4.8 to 0.19 per cent. The increasing fall in the net return may become disastrous in 1931, since the result may be the total loss of the family capital return and of the operator's labour earnings. In other words it is not merely the labour and the capital that would remain without interest and without remuneration, but also all maintenance of values would become impossible, with consequent complete decay and ruin of the small farm holders. It is true that this decadence of operating capital from the point of view of the quality as well as quantity does not date from to day or yesterday, it is rather the natural consequence of a long and dangerous economic crisis, culminating in a general destruction of operating capital due to the recent aggravation of the crisis.

Apart from this abrupt fall in net return, it is obvious that the farming return is everywhere of a negative character, which is to say that in place of profits there are losses.

	Number of holdings —	Profit or loss on total farm assets Gross return % —	Cost of production % —
1928	28	— 7.20	— 5.72
1929	28	—29.66	—22.87
1930	28	—42.24	—29.62

These figures illustrate the adverse character of the balances. To secure a net return on capital, the gross returns would have to be increased by so much per cent., or farming expenses would have to be reduced in the same proportion.

In order to judge of the results of small farm holdings it is essential to adopt an entirely different standpoint from that taken up in respect of large farms. Capital and labour are invested in the small holding in proportions quite other from what is found in connection with the large farms. According to data available, the small holder sometimes invests the whole of his small capital in his farm, while also putting into it his whole capacity for work and that of his family. It is for this reason that if it is desired to judge of the success of an enterprise, in the case of the large farms it is the net return that should be considered, while in the small holdings it is rather the remuneration of labour. With this object, all possible attention has been given to the clear and precise statement of the agricultural incomes. The agricultural income can only be regarded as satisfactory if it covers the fair wage claim of the farmer and his family (that is, as much as a good farm servant in addition to can earn the wage claim of the head of the farm enterprise), and if it yields a fair interest in relation to the family capital, *i. e.*, the same interest as would be obtained from other investments giving similar guarantees.

		1928	1929	1930
Agricultural income per				
“hold”	pengòs	158.46	107.75	88.53
Wage claim per “hold” of				
the farmer and his family	”	94.67	94.67	94.67
Return on family capital				
per “hold”	”	63.79	13.08	—6.14
Family capital per “hold”	”	1,778.22	1,744.88	1,727.52
Return on family capital				
expressed as percentage				
of that capital	%	3.53	0.75	—6.14
Agricultural income per				
“hold”	pengòs	158.46	107.75	88.53
Interest at 5 % on the fam-				
ily capital per “hold”	”	88.91	87.23	86.37
Labour earnings per “hold”	”	69.55	20.52	2.16
Labour earnings per man				
day	”	2.67	0.79	0.08
Earnings per day (express-				
ed as man day) should be	”	3.25	3.25	3.25
Average wage of an indus-				
trial worker per day .	”	5.00	5.00	5.00
Labour earnings of the				
small holder are thus				
lower by	”	2.33	4.21	4.92

These columns of figures clearly prove that if the fair wage claim of the farmer and his family is indicated by means of a sum equivalent to that of normal wages, adding however the supplement due to the head of the farming enterprise, and if the interest on the family capital is reckoned at 5 per cent., the agricultural income is not enough to cover these, and in 1930 there was not enough even to cover the fair wage claim of the farmer.

If the fair wage claim of the farmer be deducted, then the family capital earns interest only at the rates of 3.53, 0.75 and —6.14 per cent. in the respective years, while if the interest on the family capital is reckoned at five per cent, then the farmer receives only pengös 2.67, 0.79 and 0.08 per day's work in the course of the three years under review.

The disastrous effects of the crisis on the peasant farms is nowhere more clearly shown than by this descending column of figures.

The following table shows the average turnover on the 28 holdings examined.

Turnover.

Cash receipts in pengos per hold.

28 holdings in Transdanubia	1928	1929	1930
Cereals	31.44	25.35	18.00
Hay and straw	0.18	0.17	0.14
Potatoes, rootcrops, etc	3.20	2.53	1.40
Other crop products	0.16	0.16	0.16
Crop proceeds	35.07	28.21	20.86
Cattle raising	44.25	44.04	43.27
Pig raising	17.49	17.49	15.64
Poultry	12.38	11.58	10.00
Other live stock	0.17	0.17	0.17
Live stock proceeds	74.29	74.18	68.45
Garden, vineyard and forest	6.63	5.53	5.00
Total farming receipts in cash	115.99	107.92	93.84

The diminution of the cash receipts representing the proceeds of the crops exceeds by 34.12 per cent. over the three years the diminution due to the fall in the proceeds from live stock. The most noticeable decline appears in the case of cereals, viz. 40.65 per cent., also in potatoes, and especially in maize; in stock breeding the difference has been greatest in respect of pigs.

Expenditure in Pengös per hold.

	1928	1929	1930
Total of farming expenses in cash.	62.23	60.62	58.87
Market supply	—	—	—

If from the total of the gross return, deduction is made of the household requirements, personal outgoings, values transferred to subsidiary enterprises, and also assignments in kind part of wages there remains the part for sale on the market. The increase of the field inventory has been calculated in the discussion of the market. According to calculations made for the holdings examined, 58 per cent. of the total gross return is directed to the market. Examining the main branches of production, 52 per cent. of the wheat is marketed, 41 per cent. of vegetables and fruits, 100 per cent. of the beef cattle, 59 per cent. of the milk, 53 per cent. of the pigs, 62 per cent. of the poultry, and 66 per cent. of the eggs.

From the market point of view also, the crisis has resulted in perceptible changes. The low prices of cereals has forced the holders to use them as stock feeds, so as to avoid complete loss. Only satisfactory prices for cereals can prevent this from happening. In this way the part of the wheat production destined

for the market is constantly subject to reduction, owing to the price of cereals, while the percentage fed to stock increase.

Social Income in pengös.

Transdanubia (28 holdings)	1928	1929	1930
interest on debts and rents	10.50	10 01	9.90
taxes	11.40	11 40	11.40
wages	33.16	30 31	26 40
wage claims	94.67	94 67	94.67
interest on family capital	68.79	13 08	— 6.14
Total social income in pengos per "hold"	215.52	159 47	136 23

The decrease of the return from the small farm holdings has naturally had an effect on land values. The price of land has declined from 20 to 40 per cent. The loss in income which is becoming increasingly serious first consumed all the reserves of capital still existing, and then resulted in many cases in a more or less heavy indebtedness. It is in short to be feared that if this depression continues, it will lead to a marked diminution in the maintenance of values. Fortunately the intensive character of the Hungarian small holdings is in particular an intensity of labour ; but this will also diminish if the remuneration of labour continues to fall.

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CO-OPERATION

Co-operation in Finland.

While in the greater number of countries the co-operative movement originated in consumers' co-operation or other local co-operative organisations which sprang up among the poorer classes, and only later became grouped into central or national Federations, the movement in Finland developed essentially in the opposite direction *viz.* from the centre to the circumference, in accordance with a plan conceived in advance. Thus, before co-operation had a practical existence in Finland, a certain number of private persons belonging to the educated classes, following the initiative of Prof. Hannes Gebhard, "the father of Finnish co-operation", set up in 1899 the Pellervo Society with the object, as stated in the rules, "of encouraging the material prosperity of the people by means of co-operation and of forming a bond between the different co-operative enterprises of the country". The improvement of the economic situation of the poorer classes was felt to be the principal means of strengthening the national sentiment of solidarity and of moral and intellectual resistance of the people against the attempts at Russification which at the beginning of the new century were gaining ground.

The Pellervo Society at once began activity. The law on co-operation, itself also largely a result of the efforts of the society, came into force in 1901 and by that time the ground was so well prepared for the co-operative ideas by means of courses, lectures, pamphlets, propaganda, model rules, handbooks, account books for dif-

ferent branches of co-operation, etc., that various co-operative enterprises were immediately formed in different parts of the country and by 1903 there were as many as 200.

§ 1. DEVELOPMENT AND PRESENT SITUATION OF THE CO-OPERATIVE MOVEMENT.

The development during the following years has not been less remarkable, and today, after only 30 years of existence, Finnish co-operation is characterised by an extent and a diversity shown by few countries in so short a time. Towards the end of 1929, there were in all more than 6,000 registered co-operative societies which had not however all developed activity. On the other hand, there were also unregistered societies, a fact which accounts for the absence of exact figures in respect of many of the branches of Finnish co-operation. Precise data are available only on the principal forms of co-operation, *viz.* the consumers' societies, the co-operative dairies, and the co-operative credit banks. As regards the other branches, only about a dozen can supply data relating to the number of societies, their membership and turnover. The data available are contained in the following table which illustrates the co-operative activity in Finland in 1928 (1).

Local Co-operative Societies in 1928.

	Number	Membership	Turnover (millions of Finnish marks)
Consumers' societies	548	432,800	3,187
Co-operative dairies	576	70,200	897
Co-operative banks	1,427	131,000	939 (2)
Co-operative societies for sale of livestock	8	5,000	112
Co-operative egg marketing societies	95	7,000	13
Forestry co-operative societies	11	4,500	98
Farm machine societies . . .	450	4,500	3
Peat litter co-operative soci- eties	165	4,100	5
Co-operative saw mills, flour mills and electric power so- cieties	190	9,500	30
Telephone co-operative soci- eties	250	12,800	7
Co-operative housing societies	130	2,200	9
Co-operative societies for joint holding of breeding stock .	380	5,200	1.3
Other societies	300	6,000	20
Total	4,630	695,100	5,322

The number of co-operative societies which were active in 1928 may be estimated at 4,630 and their total membership as 695,100. This latter figure, however, does not

(1) The table does not include mutual insurance societies which have a membership of several hundreds of thousands. Although there can be no doubt of the co-operative character of the greater number of these undertakings, under the Finnish law they cannot assume the form of co-operative societies.

(2) Sums due to the co-operative banks from their members at the end of 1928.

stand for that number of different individuals, as a large part of the population frequently are members of 5 or 6 or even more co-operative societies at once. The turnover of the co-operative societies in 1928 is estimated at 5,300 million marks, including the sums due to the co-operative banks by their members.

At an early stage the local co-operative societies with the support of the Pelervo Society formed central organisations. The central organisation of the co-operative banks was, as will be shown later, an accomplished fact in 1902, that is, at a date when there was not even a single local bank. In 1904, followed the formation of the union of consumers' societies, and in 1905 the central dairy organisations and the co-operative agricultural purchasing union were established. At present there are in Finland two wholesale co-operative stores, two co-operative unions for export of butter, and two co-operative agricultural purchasing unions while the co-operative societies for sale of livestock, the co-operative egg marketing societies and the forestry co-operative societies have each established their central organisation. The following table illustrates the activity of these centres of co-operative societies in 1929 and shows a membership total of 3,798 local societies, a total sale of more than 4,000 million marks and a total surplus of about 42 million marks.

Unions of Co-operative Societies in 1929.

	Number of member societies	Sales in millions of marks	Surplus in thousands of marks
Suomen Osuuskappojen Kes-			
kuskunta (S. O. K.) = Finnish			
Wholesale Warehouse . . .	425	1,054	18,946
Osuustukkukauppa (O. T. K.) =			
Co-operative Wholesale Ware-			
house	112	772	10,281
Hankkija = Co-operative Agricul-			
tural Purchasing Union (Fin-			
nish)	984	338	4,318
Labor = Co-operative Agricul-			
tural Purchasing Union (Swed-			
ish)	128	110	364
Valio = Co-operative Butter Ex-			
port Union	513	709	3,462
Enigheten = Export Union of the			
Swedish co-operative dairies .	24	50	362
Karjakeskuskunta = Central Co-			
operative Live Stock Union . .	34	107	531
Muna = Central Co-operative			
Egg Export Union	152	9	162
Metsakeskus = Central Co-oper-			
ative Union of Forest Owners	11	101	322
Osuuskassojen Keskuslainara-			
hasto = Central Bank of Co-			
operative Rural Banks . . .	1,415	(1) 828	3,112
Total . . .	3,798	4,078	41,860

(1) Credits granted by the Keskuslainarahasto at the end of 1929.

Before giving the more detailed account of the different branches of co-operation in agriculture this brief preliminary survey of the development and activity of Finnish co-operation should be completed by a mention of the five central organisations which cover the country and undertake instruction and propaganda in connection with co-operation. Among these organisations attention may first be drawn to the Pellervo Society, which is always the most important centre for Finnish co-operation, although several of its former objects are transferred to other central organisations, as these latter become stronger. The Society organises theoretical and practical courses in co-operation, is active in founding co-operative societies and similar undertakings, publishes model rules, handbooks, account books and scientific works on co-operation, edits "Pellervo", a weekly journal of agriculture and co-operation with a circulation of over 100,000 copies, "Nuorten Pellervo", a magazine for young people (circulation 11,000), "Suomen Osuustoimintalehti", vocational journal for managers and employees of co-operative societies (circulation 7,000), "Pellervon Vuosikirja", annual report of co-operative activity in Finland, and "Pellervon Kalentri", almanac of agriculture and co-operation. At present the Society includes the following Central Co-operative Unions: the Central Bank of Rural Co-operative Banks, the Finland Wholesale Warehouse (S. O. K.), the Co-operative Agricultural Purchasing Union "Hankkija", the Central Co-operative Butter Export Union "Valio", the Central Co-operative Union for Sale of Live Stock, the Central Co-operative Forestry Union, the Central Co-operative Egg Marketing Union "Muna". In addition nearly 1400 local co-operative societies are directly affiliated to the Pellervo Society.

Mention should also be made of the Swedish Co-operative Union of Finland (Finlands Svenska Andelsförbund) which corresponds to Pellervo in its general objects. The Union carries on among the Swedish population of Finland the co-operative propaganda by the spoken and the written word, it examines statutes and schemes of organisation, undertakes vocational instruction of Swedish co-operators, carries out audits for the societies, undertakes the publication of Swedish co-operative literature and watches over the interests of Swedish speaking co-operatives in the central bilingual organisations throughout the country. The membership of the Union at the present time is 111, the greater part being local co-operative societies. There also belong to the Union the two central Swedish organisations for the export of butter (Enigheten) and for the supply of farm equipment (Labor) as well as the three Swedish associations of co-operative dairies. The journal of the Union has a circulation of 4000 copies. Finally there are three other central organisations for co-operative instruction and propaganda: the General Association of Co-operative Stores (*Yleinen Osuuskauppojen Liitto*), which works in close contact with the Finnish Wholesale Warehouse (S. O. K.); the Central Union of Co-operative Retail Warehouses (*Kulutusosuuskuntien Keskusliitto*), which is a sister organisation of the Co-operative Wholesale Warehouse (O. T. K.); and the Central Association of Rural Co-operative Banks (*Osuuskassojen Keskusliitto*) which since 1928 has undertaken the work of instruction and propaganda up to then accomplished by the Central Bank of Co-operative Rural Banks. Further details of the work of these three central educative organisations will be given later.

§ 2. THE LEGAL POSITION OF THE CO-OPERATIVE SOCIETIES.

The general position of co-operation in Finland was regulated, as has been stated, by the Law of 10 July 1901, with the modifications added in 1918 and 1927.

In accordance with the provisions of this law three types of co-operative societies as regards liability may be formed:

1. societies the members of which are exempt from all individual liability and where creditors are obliged to be satisfied with the assets of the society only ;
2. societies, the members of which are personally liable for all the engagements of the society but only within a certain measure prescribed in the statutes ;
3. societies, the members of which assume an unlimited liability for the debts and engagements of the society.

In accordance with this law, all enterprises the object of which is to encourage the industrial development of their members or to improve their living conditions, and in which the mutual liability takes one of the forms indicated above are considered as co-operative societies.

The law authorises the exercise of co-operative activity in all spheres of economic life, except insurance activity. In addition the societies are authorised, on a strictly limited basis, to engage in credit operations.

The types of credit operations in which co-operative societies are permitted to engage are :

1. they may act as savings banks for co-operative stores securing to these the working capital necessary ;
2. credit operations of rural co-operative banks

As savings banks of the co-operative retail stores they are prohibited from accepting funds from others than members of the co-operative society. As regards the rural co-operative banks, they are empowered since 1920 to accept deposits from non-members but they are prohibited from lending capital to nonmembers.

For the formation of a co-operative society it is necessary for at least three persons to sign an agreement containing the rules of the society and the names of the members of the management council. The rules must indicate the name of the society and must define the kind of business undertaken, the amount of the shares, the method of paying shares and of creating a reserve fund, the liabilities of members in respect of the engagements of the society, the regulation of the division of profits, the procedure for the election of members of the committee, the indication of the date of the closing of accounts and the arrangements for publishing them, etc.

The rules of a co-operative society must be approved by the Governor of the department in which its office is situated. If however the projected enterprise of the society is legal and its rules in accordance with the law, the authorities cannot withhold approval. If a society desires to conduct a credit business, the Governor has to submit the rules to the examination and approval of the Ministry of Trade. Before giving approval however, the authorities in question are expected to ask the opinion of the Pellervo Society. After having obtained authorisation to begin operations, the co-operative society must ask to be entered in the official trade register such registration conferring privileges identical with those of other legal societies.

Membership is open to all individuals (even children) and public bodies, such as co-operative societies, associations not having a commercial object, companies, etc.

A member of a co-operative society may withdraw at any time, not earlier than two years after admission, unless some other provision is made by the rules of the society. One year after the withdrawal of a member, the entrance fee must be returned to him.

In the course of operations the only payment that may be made by a co-operative society to its members, apart from their shares, is the due proportion of the profits. At least the tenth part of the surplus of each working year must however be paid to a reserve fund, until that has attained the sum fixed.

Members' control over the affairs of a co-operative society is exercised by the general meeting or according to the amendment made in 1918 of the law, by the

representative meeting, elected by the members according to the proportional system. In the latter case the number of the delegates and the method of appointing them must be indicated in the rules.

Each member has one vote only. If however in accordance with the rules the majority of the members consist of other co-operative societies, companies or associations, more than one vote may be granted to these member groups, in accordance with the amendments passed in 1918.

According to the original provisions of the law, the written consent of all the members was necessary for increasing the amount of the entrance fee (or other payments) of members or for extending their liability to another sphere. This provision during the post-war inflation was a serious obstacle to the financial consolidation of the co-operative movement. By the amendment passed in 1927, a decision on this point was valid, if it had been voted by two consecutive meetings in which it had obtained the support of at least three-fourths of the members present. A member who is not in agreement with such a decision is however free to withdraw, without regard to any limitation of the right of withdrawal that may appear in the rules.

The general meeting is summoned by the management committee, but it may meet also by request of one-tenth of the number of members.

The management committee is elected by the general meeting or by the representative meeting. Members of the management committee are liable for any loss incurred by the society in consequence of their action.

The registration of the rules of a co-operative society is not subject to the payment of any fee, and under the law on the stamp tax co-operative societies enjoy many other reductions.

Co-operative societies are obliged to pay all State taxes, communal taxes and ecclesiastical dues. The State taxes are graduated taxes on income and owned capital. Municipal taxes are based on income, in proportion to value. For some time past however, the State and the municipalities have granted a measure of relief to co-operative societies in regard to the payment of these taxes. Thus the co-operative societies the object of which is the supplying of consumers with the necessities of life or of ensuring their production, are at the present time authorised under certain conditions to pay taxes only on the half of their income.

As regards municipal taxes, however, this reduction is not granted for the surplus resulting from the manufacture or the transformation of industrial products, nor for that resulting from real property. The reduction in question applies equally to the ecclesiastical dues which are calculated on the same basis as the municipal taxes.

Finally it should be noted that according to the law of 1925 on accountancy, co-operative societies with a savings bank, as well as those in which the members' liability is unlimited (with the exception of the co-operative credit societies) are obliged, as are all other commercial enterprises, to forward to the Registration Office, copies of all balance sheets and all profit and loss accounts, as well as all information relating to their annual turnover and to depreciation with a statement of the causes leading to such depreciation. These documents are open for general inspection at the Registration Office.

§ 3. THE CONSUMERS CO-OPERATIVE MOVEMENT.

In the course of a survey of agricultural co-operation in Finland it is impossible to ignore, any more than in the case of Denmark, the consumers' side of the move-

ment. As in Denmark, the Finnish consumers' co-operative societies are most widely distributed among the rural population and as in Denmark and even to a greater extent are engaged in the sale of farming requisites ; stock feeds, chemical fertilisers, farm machines, oils, cement, iron goods, etc. On the other hand the sale of members' products (hay, eggs, butter, meat, garden produce, etc.) has become every day a more important part of the activity of the Finnish consumers' co-operative societies.

Although in certain towns an early as 1880 and 1890 and the following years, several purchasing societies of a more or less co-operative nature had been formed, the society set up by the factory workers of Finlayson at Tammerfors in 1900 is usually considered as first consumers' co-operative society properly so called. In the opening years of the new century this society exercised with the Pellervo Society a considerable influence on the efforts directed at forming for the consumers' societies a central organisation. These efforts were in 1904 successful, as at that date 12 local societies formed at Tammerfors "The Finnish Wholesale Warehouse", usually known as the S. O. K., from the initials of the Finnish name of the organisation (*Suomen Osuuskauppojen Keskuskunta*). The activity of the S. O. K. was in the early days limited merely to the giving of advice to co-operators ; after the lapse of a year it inaugurated a wholesale trade on its own account, and was in this manner transformed into an organisation of a twofold character of the Swiss type, *i. e.*, with a commercial and an educative activity combined in one body. Some years later only, in 1908, the branch of the S. O. K. engaged in advisory and propaganda work was separated and these activities taken over by a special organisation "The General Association of the Co-operative Retail Warehouses" (*Yleinen Osuuskauppojen Liitto*), or the Y. O. L. simply), which however, as has been stated above, works in close connection with the S. O. K., in so far as its central office is identical with the information office of the S. O. K.

Between 1903, the year preceding the foundation of the central organisation, and 1916, when the consumers' co-operative movement split up as explained in the following paragraph, the number of the local co-operative societies increased from 72 to 474 and their total membership from 14,000 to 182,000. The progress of the central organisation has not been less striking. Between 1905 and 1916 its turnover rose from 1 to 72 millions of Finnish marks and in 1916 the number of these member societies grouped nine-tenths (432) of all the consumers' co-operative societies in the country.

The discussions which in 1916 led to the splitting up of consumers' co-operation in Finland were not caused by differences of opinion on the subject of the fundamental principles of the movement, but by varying opinions as to the attitude which consumers' co-operation ought to take towards certain other social movements — the workers' syndical movement, rural co-operation, etc — and in particular by differences of opinion on the subject of the right of equal voting power which according to the rules the small and the large societies possessed at the general meeting. As the co-operative societies in the larger centres became more important, this clause seemed increasingly to be unjust and oppressive and in consequence they on several occasions proposed a modification of the rules with the object of giving a stronger representation at the annual meetings to the larger co-operative societies. These proposals were however repeatedly rejected by the small rural co-operative societies, which were the more numerous although representing a smaller total of members. When all discussions had proved to be useless, the societies of the towns and manufacturing areas as well as a certain number of the societies of the cultivators left the General Association of Co-operative Stores in 1916 and formed a

new central organisation for the work of information and propaganda, "The Central Union of Co-operative Stores (*Kulutusosuuskuntien Keskusliitto*, or abbreviated, simply K. K.). In the meantime the societies which were grouped in this new union continued to buy from the S. O. K., but when in the following year, 1917, the Congress of the S. O. K. once more rejected the proposal for modifying the system of representation, the co-operative societies affiliated to K. K. initiated a new wholesale trading body, the Co-operative Wholesale Warehouse (*Osuustukku kauppa*, or abbreviated, the O. T. K.).

The split in Finnish consumers' co-operation was thus an accomplished fact. It is quite clear that in a small country like Finland this division must be a serious hindrance to the development of the production enterprises connected with the consumers' co-operative movement and to its acquisition of the necessary capital. The establishment in several localities of two competing co-operative organisations has naturally also resulted in useless expense for consumers. On the other hand, it cannot be denied that the split has had up to a certain point a stimulating effect on the co-operative movement and has restored peace and brought about a fine rivalry between the two branches in the encouragement of the movement which can only help its development.

It should be added that collaboration, even after the split, has frequently taken place, when it is a question of protecting the mutual interests of co-operation. Beyond that collaboration of a more practical nature was initiated in 1928 between the two movements which at this period became members of the Scandinavian Co-operative Association of Wholesale Trade (*Nordisk Andelsforbund*), a buying organisation based on co-operative principles and formed by the grouping of the Co-operative Wholesale Associations of Denmark, Norway and Sweden, and since 1928, of Finland. There is little doubt also that before long forms will be found for collaboration between the two movements in relation to their business undertakings and their production.

Although the societies belonging to S. O. K. are called "neutral" and the others, represented by O. T. K., "progressive", two epithets of which use will later be made, both the two movements are completely neutral in regard to politics and religion. It is however true that their political points of view are differently directed, the majority of the S. O. K. societies being peasant farmers, while the societies belonging to O. T. K. draw their membership mainly from the working population in the towns and the industrial areas. The individual membership of the societies belonging to the S. O. K. is at present composed up to more than two-thirds or 67.9 per cent. of landowners, tenants and other farmers, while 19.5 per cent. are salaried workers (school teachers, State officials and municipal officers, etc.). It is not however correct to consider the O. T. K. as an exclusively urban organisation. In 1928, for example, nearly one-third (28.9 per cent.) of the individual membership was made up of independent peasant farmers, tenants, *torpare* and farm workers.

The "Neutral" Movement, 1918 to 1929. — As shown on the following table the number of members of the "neutral" societies increased rapidly from 1918 to 1920, and the turnover still more rapidly, partly however, as the result of the depreciation in the value of the currency. If the figures are reduced to the value of the present currency, it will, however, be found that the increase has been real and not only apparent. During the difficult period of stabilisation from 1920 to 1923 the development was checked, but was resumed and went on steadily during the following years. In 1928 the number of members rose to 208,000 and the turnover to 1,824 million marks, or 8,720 marks per member. As will be seen in the table the number of societies on the other hand has fallen from 484 in 1920

to 419 in 1928 as a result of the concentration carried out under the conviction that the larger societies are also the most efficacious, the most solid and the most useful to their customers. The average number of warehouses per society increased in 1928 to 4.8.

Development of the "Neutral" Movement in Consumer's Co-operation, 1918-29.

Year	Number of societies	Number of warehouses	Number of members	Turnover (millions of marks (1))
1918.	434	988	128,053	312
1919.	477	1,351	161,027	518
1920.	484	1,587	174,570	933
1921.	482	1,727	178,072	1,030
1922.	466	1,694	174,520	1,032
1923.	462	1,673	172,938	1,079
1924.	459	1,700	178,997	1,207
1925.	451	1,749	181,892	1,292
1926.	434	1,817	187,982	1,385
1927.	423	1,903	197,182	1,598
1928.	419	2,004	207,707	1,824
1929.	425	—	217,170	1,879

It has been stated that the Finnish rural co-operative societies largely also undertake the supply of farm requisites and that the sale of the agricultural products of members has become an increasingly important branch of their activity. In 1928 the supply of requisites and the sale of members' products amounted to 30 per cent. of their total turnover, as against 20 per cent. in 1920. Some of the larger rural societies affiliated to the S. O. K. have erected granaries — small but completely up to date — for the reception, cleaning and drying of the cereals of members delivered for sale.

The production enterprises of the local societies affiliated to the S. O. K. have not so far made much progress. In 1927 there were 74 of these including 48 bakeries, but the majority were only small establishments, the value of the goods consigned amounting to not more than 30 million Finnish marks, or a small fraction only of the turnover of the societies.

In the two branches of consumers' co-operation in Finland, the "neutral" and the "progressive" movement, the members' contributions are very low, and in both a very large proportion of the profit is paid into the reserve fund, while members receive a much smaller share than is usual in other countries. In consideration of the small incomes and of the shortage of ready money among the farming households, the contributions were fixed when the movement began at from 10 to 25 Finnish marks only, an amount which after the depreciation of the currency it was very difficult to increase, in view of the fact that, in accordance with the original provisions of the law on co-operation, the written consent of all members of the society

(1) In comparing the different years, note must be taken of the changes in the value of the Finnish mark after the pre-war period, when the parity was 518 marks = 100 dollars. In consequence of the world war and the civil war which followed, the currency was seriously affected but by means of the law of 21 December 1925, it was once more stabilised. The stabilisation involved a return to the gold basis monetary system but at a parity lower than the pre-war or at a rate of 39.7 marks per 100 dollars. From 1916 to 1925 the average price of Finnish marks expressed in dollars was as follows: (1918: 8.28; 1919: 15.58; 1920: 29.27; 1921: 52.07; 1922: 46.60; 1923: 37.42; 1924: 39.86; 1925: 39.70).

was necessary. The article in question was modified in 1927, but the effects of the modification are not yet very obvious. The average contribution per member in the societies affiliated to the S. O. K. remains at 41 Finnish marks. When however new consumers' societies are established, the contribution is not as a rule fixed lower than 100 marks, an amount which may be relatively small in comparison with the contribution usually fixed in other countries.

The greater part of the profit, or 70.2 per cent. in 1928, is allotted to the reserve fund. The margin of profit is however narrow, and the rates of interest high and as there are accordingly no large profits (in 1928, for instance, the profit was only 2.3 per cent. of the total sales) the formation of reserve funds cannot advance with any rapidity. In 1928 the owned capital of the societies affiliated to the S. O. K. (contributions, funds, profits) amounted only to 27.3 per cent. of their working capital. The borrowed capital was not however of a kind to compromise the independence of the societies. It consisted for the most part of deposits of the savings banks of the members, bills payable to members' orders, as well as credits made by the rural co-operative banks and savings banks, *i. e.*, by institutions the object of which is similar to that of the consumers' co-operative societies.

The fact that the consumers' co-operative societies have included on their programme the establishment of savings banks has not a little contributed to the sound financial progress of these societies. In the terms of the law, the banks can freely make use of deposits entrusted to them, but on the other hand they can only accept deposits from their members. In 1928, 165 co-operative societies had established savings banks and the total of their deposits amounted to 156 million Finnish marks.

Although so large a part of the sales made by co-operative societies affiliated to S. O. K. consists of supplies of farm requisites, the societies do not give credit except to a very small extent. A certain increase in credit given has, however, been noticeable during these last few years, the co-operative societies finding themselves obliged to follow the example of the other establishments which supply requisites to farmers and to allow purchasers to postpone payments. Credits outstanding of the societies have thus risen from 1.3 per cent. of the turnover in 1921 to 3.1 per cent. in 1928.

Turning from the local societies affiliated to S. O. K. to the activity of the central organisation itself, it will be seen that as shown in the table below its development has not been less remarkable.

The Activity of S. O. K., 1918-1929.

Year	Total sales millions of marks	Value of production of S. O. K. factories in % of total sales	Net profit		Funds	
			millions of marks	in % of sales	millions of marks	in % of sales
1918	108	4.2	3.6	3.4	12.0	11.2
1919	205	2.5	4.7	2.3	16.1	7.8
1920	324	4.6	4.3	1.3	20.0	6.1
1921	359	5.7	3.8	1.1	23.7	6.6
1922	417	8.3	5.5	1.3	25.4	6.8
1923	517	8.2	6.4	1.2	34.2	6.6
1924	630	7.3	9.5	1.5	43.1	6.8
1925	701	7.0	10.6	1.5	53.0	7.6
1926	742	7.3	12.0	1.6	64.4	8.7
1927	848	7.1	14.8	1.8	75.8	8.9
1928	1,003	8.0	18.6	1.9	93.2	9.3
1929	—	—	—	—	—	—

Among the commodities (1) sold by the local societies there are very few that they cannot purchase from the S. O. K., so that over a period of years there has been a constant increase in the purchases made by the local societies from the central organisation : thus in 1928 they purchased from the S. O. K. 76.3 per cent. of their sales as against 37.9 per cent. in 1921.

The direct productive activity of S. O. K. has also developed, and in 1928 the value of the output of the factories of S. O. K. was 8 per cent. of the total sales. It has not as yet attained really considerable proportions, a fact which is due in the first instance to the shortage of owned capital. The funds of S. O. K. have decidedly increased, and every year in accordance with the rules three-fourths of the net profits are placed to these funds, in spite of this they remain at 10 per cent. only of the total sales or at about 93 million marks. According to the closing of the accounts of S. O. K. on 31 December 1928 the borrowed capital, invested in its activity, amounts to 144 million marks, of which 116 million is on a short term basis.

The direct production activity of S. O. K., which began in 1914 with the establishment of a brush manufactory, a clothing factory, a coffee roasting depot, a packing office for fruit and spices, now includes also a chicory factory, a knitted goods factory, a chemicals factory, a match factory (2), a saw-mill, a margarine factory, and a flour mill with capacity for grinding 12 million kilos of grain per year.

In addition to the sections of the Central Office of the S. O. K. which deal with commercial activity there are also other sections including the credit section, the function of which is to supervise the working of the co-operative societies and to verify their accounts ; the laboratory which analyses the samples of merchandise sent by the co-operative societies ; the legal section, which assists the societies on legal questions, in disputes and in the elucidation of fiscal questions ; the building section, which draws up plans for the construction of commercial buildings and depots for the societies ; and the information section, which is at the same time, as has been stated, the central organ of the Y. O. L., the General Association of Co-operative Retail Warehouses.

The Information Section carries out varied types of work. It undertakes the supervision and inspection of the savings banks of the co-operative societies, assists the societies in the choice of officers and employees, superintends in various ways the vocational training of persons who intend to enter the service of the co-operative societies, deals with propaganda and informative work and assists the societies in their work of propaganda.

Among the most important means of propaganda employed by the Information Section are two periodicals, " Yhteishyvä " in Finnish with a circulation of about 150,000 copies, and " Samarbete " for Swedish members with a circulation of about 25,000 copies. In addition for the use of members of the committees and officers of the Finnish co-operative societies the Section publishes a review entitled " Osuuskaup-

(1) According to the agreement in 1905 between the S. O. K. and Hankkija, the Co-operative Agricultural Purchasing Union, S. O. K. is not to sell farm requisites to the local societies. Hankkija or, for the Swedish regions in Finland, " Labor ", are to have the monopoly of this business, and on the other hand Hankkija undertakes not to do business in consumption commodities.

(2) It may be of interest in this connection to mention that after a prolonged struggle between the Swedish Match Trust and the two co-operative match factories (those of S. O. K. and of O. T. K.) an agreement was finally made according to which the co-operative factories acquired a great influence over the fixing of prices of matches on the national market. Thus the internal price cannot be raised without the consent of the co-operative factories, while, on the other hand, export must be effected in co-operation with the factories dominated by the Trust.

palehti ", and for the officers of the Swedish co-operative societies the review " *Handelslaget* ".

In this connection may be mentioned the School of Co-operation of Y. O. L. at Helsingfors, which began work in 1919 and is held in two sessions, a Finnish and a Swedish, the course lasting two years.

There is still another side to the activity of the S. O. K., and one of great importance, *viz.* that of insurance. The S. O. K. founded in 1919 and 1920 two insurance societies, one known as " *Elnövara* " for the staff of the S. O. K., and one of the affiliated societies, " *Oma* " for the workpeople employed by the central organisation and in the factories of the affiliated societies. These societies deal with life insurance, and insurances against sickness, disablement and old age. The S. O. K. in addition founded in 1909 a fire insurance company " *Tulövara* " which insures the property of societies as well as that of their members. The largest and most important among the insurance societies associated with the S. O. K. and its societies, is however the life insurance company, " *Pohja* ", which was founded in 1923, the policy holders numbering in 1928 over 40,000, mainly belonging to the peasant class and that of small holders.

The supreme control of the S. O. K. rests with the general meeting which elects the Council of Management, consisting of 18 members, approves the accounts, and the annual report of the administration and regulates the more important commercial questions. Each member has one vote only at the general meeting. The Council of Management elects the administration which deals with current business.

For local propaganda and for exchange of experiences among co-operative societies, the Y. O. L. works through district committees, one in each of the districts into which Finland is divided for the purpose. The Committees, which consist of three members and three substitute members elected by the societies in the district at their annual meetings, arrange informal meetings between the administrative officers of the societies, and form with the Management Council of the S. O. K. a delegation which meets each year and which is of great importance for the contact it maintains between the central administration of the movement and the individual members.

The " Progressive " Movement, 1918 to 1929 — Although the " progressive co-operative movement attained its full development in the towns and among industrial workers, this brief survey of co-operation in agriculture in Finland cannot ignore this branch of consumers' co-operation, in view of the fact that nearly one third (28.9 per cent. in 1928) of its members are independent small farmers, tenants, holders of land in exchange for labour and farm workers. There is the further consideration that the co-operative societies affiliated to the " progressive " movement undertake the sale of farm requisites, purchase members' products and consign them to the societies in the towns and industrial centres.

The development in the " progressive " movement since 1918 has not been less remarkable than that in the " neutral " movement. Thus, from 1918 to 1928, the number of members belonging to the " progressive " co-operative societies increased from 95,000 to 226,000, the number of warehouses from 503 to 1347 and their turnover from 147 to 1,358 million Finnish marks. As a result of efforts at concentration, on the other hand, the number of societies remained practically stationary from 1922 (there being 112 societies in 1928), and generally speaking no new societies are being formed at present, the policy being rather to increase the branches of societies already existing as need arises.

In 1928 each society had on an average 12 warehouses and a membership of 2,014 members and a turnover per member of more than 6,000 marks.

The value of the merchantable commodities of the production enterprises belonging to the local "progressive" societies amounted in 1928 to 292 million marks, or to 21.5 per cent. of the total turnover of the societies. In addition to the sale of commodities and to production, nearly all the large co-operative societies in the towns and industrial areas — both "progressive" and "neutral" — own cafés and restaurants. At the end of 1928 there were 88, exploited by different societies affiliated to O. T. K.

The "progressive" societies, as the "neutral", are obliged to operate in a great measure with borrowed capital. At the end of 1928 their own capital amounted only to 193 million marks or to 26.4 per cent. of the working capital, a state of affairs due primarily to the smallness of the contributions of members. In 1928 these amounted only to 25 marks per member. The societies, it is true, always transfer the greater part of the surplus to the reserve fund (69.5 per cent. in 1928) but as this surplus is very small (in 1928, for instance, it was only 2.3 per cent. of the total sales) it is evident that the increase of capital cannot be rapid.

As a partial remedy for this shortage of capital the greater part of the "progressive" societies have established savings banks as have also the "neutral" societies. At the end of 1928 the total of deposits of these banks amounted to 263 million marks.

Equally with the "neutral" societies the "progressive" societies are resolutely opposed to members' purchasing on credit, a practice which now seems to be extinct. The debts of the societies thus at the end of 1928 amounted to 8 million marks only, i. e., to 0.6 per cent. of the total turnover.

In the smaller societies, the administrative bodies consist of the general meeting and the management, in a certain number of medium sized societies, of the general meeting, the administrative council and the management, while in the larger societies which have abolished the general meeting, the work of administration is carried out by a committee of representatives of from 20 to 60 members, elected by proportional voting, and a board of management.

As already mentioned, the "progressive" movement possesses two central and separate organisations: the Central Union of Co-operative Retail Warehouses (*Kulutusosuuskuntien Keskusliitto*, or abbreviated, K. K. simply) for the work of information and propaganda, and the Co-operative Wholesale Warehouse (*Osuustukku kauppa*, abbreviated, O. T. K.) for the wholesale trade business.

The activity of K. K. is distributed over some ten sections among which mention should be made of the propaganda section, which undertakes all forms of oral propaganda; the publications section, which edits two popular journals, one Finnish with a circulation of 125,000 copies (1) and a Swedish, as well as two reviews for the staff; the educational section, which has organised four correspondence courses, for different groups of co-operative agents, as well as several special lecture courses, intended for the managers of co-operative societies, of bakeries, restaurants, for accountants, etc.; the section of instruction which, controls the commercial activity of the societies and gives advice as regards their management; and finally the legal, the building and the investment sections. All local societies have elected the K. K. as one of their auditors, and the greater number of them ask advice from the management of the K. K. in respect of applicants for posts of managers, and also as re-

(1) Taking into consideration that the largest local co-operative society affiliated to K. K., "Elanto" at Helsingfors, also publishes a journal for its 40,000 members, it may be stated that the popular journals of the co-operative progressive movement are read by two thirds of the members of the local "progressive" societies.

gards their own relations with their workpeople. The purchase of land, the erection of new buildings, establishment of new warehouses or new factories can only as a rule be taken in hand after consent has been obtained from K. K.

In this connection there may be mentioned the central organ of the women's auxiliary committees, which is under the authority of the management body of K. K. These committees, formed in 1929 by a decision of the K. K. Congress, work in connection with the local co-operative societies and their object is to foster loyalty to co-operation among women, young people and children, and to spread information in view of encouraging household economy. At the end of 1929, not less than 58 of the 112 societies affiliated to K. K. had already their own women's auxiliary committee.

At the Congress of the K. K. Union each local society has the right to send one representative, who has one or more votes, according to the membership of the society. The Congress elects a council of 17 members, who in their turn elects a management board of 7 ordinary members and 2 substitute members. Only two of the members are paid.

Development of the central organisation for wholesale trade of the "progressive" societies (O. T. K.) has been very rapid. From 1918 to 1928 its turnover rose from 14 to 814 million marks. It works in five sections one of which is the agricultural section, which undertakes the sale to the rural societies of farm requisites and purchases the products of members for delivery to societies in towns and in the industrial areas. The extent of the custom of the "progressive" societies is of great importance to the central organisation. Of all the societies, 43 purchased from the central organisation more than 75 per cent. of what they sold, while 62 purchased from 50 to 75 per cent. and 6 between 25 and 50 per cent. The O. T. K. surplus which usually amounts to only 3 to 3 ½ per cent. of the sales is transferred as a whole to the reserve fund, except for small sums left at the disposal of the Council of Administration. As the members' contributions are small, the organisation is obliged, as is the S. O. K., to work in large measure with borrowed capital. This has naturally greatly retarded any development of its own manufacturing activity. In 1928 the production value of the O. T. K. factories amounted only to 64.7 million marks, or 8 per cent. of the total sales.

The "progressive" movement, like the "neutral" movement, concerns itself with insurance activity. In 1919 a fire insurance company, "Tulenturva", and in 1923 a life insurance company, "Kansa", were formed, and these two enterprises have since 1928 worked in close contact, under the same management, etc.

The highest authority of O. T. K. is the general meeting, in which the local affiliated societies have one vote for each two hundred members. The general meeting elects an administrative council of 12 ordinary and 4 substitute members. Two only of the ordinary members and one of the substitute members are paid.

(To be continued).

H. L.

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AGRICULTURAL ECONOMICS AND SOCIOLOGY

CO-OPERATION

Co-operation in Finland (*concluded*).

§ 4. THE CO-OPERATIVE DAIRIES.

CO-OPERATIVE ORGANISATION OF THE EXPORT OF DAIRY PRODUCTS.

The dairy industry in Finland carried on was, at the end of last century, exclusively by trading companies or by private enterprises. It was only about the year 1900 that the Pellervo Society took the initiative in founding co-operative dairies, but progress was so rapid in rendering this branch of agricultural industry co-operative that after some ten years nearly the whole of the Finnish dairy industry had come under the control of the co-operative dairies. The development of these dairies from the foundation of the first society (in 1902) may be shown as follows :

Development of the Co-operative Dairies 1902-1929.

Years	Number of Dairy Societies	Number of Members	Sales (millions of marks)
—	—	—	—
1902	27	2,000	1.8
1905	168	16,000	10.5
1910	285	30,000	25.2
1915	381	41,000	46.8
1920	345	42,000	270.8
1925	602	58,000	697.7
1926	563	62,000	705.2
1927	664	68,000	843.5
1928	676	70,000	897.3
1929	682	73,000	943.9

At the present time more than four-fifths of the Finnish dairies are co-operative and about 95 per cent. (22 ½ millions of kilogrammes) of the aggregate production of dairy butter comes from the co-operative dairies.

The 73,000 members of these societies owned in 1929 in all 438,000 cows, or

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about one-third of the total of the cows in Finland, that is to say, the greater proportion of the cows yielding milk for sale

Out of the 648 dairy societies which during 1929 supplied data in regard to the nature of the liability of their members, 103 were founded as co-operative undertakings the members of which had no individual liability ; 422 were founded as co-operative undertakings with limited liability, and 123 with unlimited liability. At the present time all new co-operative dairies are established on the basis of limited liability.

According to the rules, which for all the co-operative dairies of Finland are drawn up on the the model of the rules of Pellervo, the members must pay for each cow that belongs to them a contribution of from 100 to 300 marks and must undertake to pay sums to the society, in the form of permanent loan, sufficient to build up a capital equivalent to one and a half times the total amount of the contributions mentioned. These contributions must be made in separate payments, the first being 25 marks, the others taking the form of money stopped out of the payment for the milk. The purchase price of the milk is fixed monthly in proportion to the selling prices realised on the dairy products, taking into account however the content in butter fat or cream as well as the general qualities of the milk as shown at the inspection held during the previous month. On the price to be paid from 5 to 18 per cent. is kept back (according to the decision of the management) for wages and other general expenses ; 3 per cent. is devoted to maintenance expenses, to new buildings and to amortisation, one per cent. is devoted to the reserve fund, 2 per cent. to the payment of contributions until full payment is made, and 2 per cent. to the supplementary loan made by the member to the co-operative society.

Members are expected to consign to the dairies the whole of their production except the quantity necessary for household purposes, and cannot resign membership before the end of the two years. A member resigning before the end of five years loses all the payments made for the supplementary loan ; if after five years, but before ten years are ended, only half the sums lent by him are refunded.

In accordance with the rules, 25 per cent. of the profits, at least, are paid to the reserve fund, until it has attained a total of 50,000 marks ; after that the contributions are invested and lastly the remainder are dealt with in accordance with the resolutions passed by the general meeting. As a result of the inflation the value of the greater part of the funds was of course reduced to almost nothing but they were built up again rapidly afterwards. On the basis of statistics supplied for 1929 and referring to the assets of 564 dairy societies, the owned capital of the dairies amounted to 115 millions of marks, or 45.5 per cent. of the total capital. The borrowed capital amounted to about 142 millions, including 33 millions lent by the State and 109 millions by the banks and private individuals. The net profit was 5.7 millions.

The supreme authority of a co-operative dairy society is vested in the general meeting which meets twice a year and elects the administrative council. The members of this latter body hold meetings every month and receive a small fixed indemnity. Current affairs are dealt with by a manager who is not a member of the council ; he must have technical qualifications as regards the dairy industry.

Co-operative dairies are organised by districts known as " Dairy Unions ". These Unions undertake to improve the industry by means of exhibitions, competitions and by securing the advice of technicians. Up to the present 14 dairy Unions have been organised, eleven of which carry on activity in the Finnish speaking regions and three in the Swedish speaking regions.

Although a number of the large farming enterprises have joined the co-operative dairies, it is mainly the small or medium sized farms that are affiliated. During 1929, about 38 per cent. of the members owned from one to three cows per head, 56 owned from 4 to 15 cows while only 5 per cent. owned more than 15 cows. The average number of cows per head was thus little more than six.

With the object of reducing costs of working, endeavours have naturally been made, so far as distance and cost of transport permit, to increase the output of the dairies, which however retain their character of typical regional or communal undertakings. A limited number only of dairies, mainly in the northern and eastern parts of Finland, carry on activity over a somewhat extended area, making it necessary to have milk collection stations.

The average membership of all the co-operative dairies in 1929 was 106, and the number of cows belonging to each was 642. The quantity of milk as consigned by weight to each dairy society during 1929 was on an average 1,082,000 kgs., or 3,962 kgs., per day and 1,533 kgs., per cow per annum. Of this quantity of milk 79 per cent. was used in butter making, about 4 per cent. in the manufacture of cheese, while the remainder was sold as whole milk, with the exception of a relatively small quantity used for the remuneration in kind of the staff. In 1929 it was calculated that for the manufacture of one kg. of butter 23.3 kgs. of whole milk was required, and 11.6 kgs. for the manufacture of one kg. of cheese.

As appears from the statistics of the dairy cow testing associations there is a steady increase in the milk yield per cow, from 1,586 kgs. in 1918 to 2,544 kgs. in 1929. The cow of Finnish breed is not however very productive from the point of view of milk yield, but on the other hand the content in butter fat of the milk is remarkably high; actually this content, taking all cows in the testing associations, amounted to 3.95 per cent. in 1929.

The working costs of the dairies naturally vary considerably according to the quantity of milk treated and according to their receipts for the handling of milk, or, if transport conditions are difficult, of the cream only. The working costs of large undertakings, where the quantity of milk handled amounts to more than one million kilos per annum, during 1929 were 152.51 marks per 1000 kg. of milk, while these costs for the smaller societies, in which the quantity of milk handled was less than one million kilos per annum, amounted to 181.46 marks. The average of the working costs for all co-operative dairies handling milk and making annual statistical returns was 157.39 marks per 1000 kilos of milk handled.

All the societies which manufacture butter for export, *i. e.*, the majority of the dairies, have adopted the system of paying for the milk according to its quality. This system has been adopted by about 85 per cent. of the dairies associated in the Dairy Unions.

Co-operative Union of Butter Export "Valio". — The export of butter is the main factor in the export trade of Finland after the export of timber and timber products. This export is essentially in the hands of the export associations of co-operative dairies known as "Valio" and "Enigheten", while only about 4 per cent. of the butter export and 35 per cent. of the cheese export are carried out by private undertakings. The Co-operative Union "Valio" is the most important of the two unions mentioned, as it exports 90 per cent. about of the Finnish export of butter and about 50 per cent. of the total export of cheese.

The "Valio" Union was founded in 1905; the table given below shows the development of its activity since that date:

Activity of the "Valio" Union 1905-1929

Year	Number of associated dairy societies	Products exported and sold in Finland			Total sale (millions of marks)	Funds (millions of marks)
		Casks of butter 50 8 kgs.	Cheese kgs	Milk and cream (litres)		
1905	34	—	—	—	—	0.06
1910	157	94,387	13,985	—	13 3	0.40
1915	251	160,698	352,163	—	35 4	1.23
1920	295	88,874	822,400	17,125,115	198,1	6.51
1925	401	245,641	2,329,281	40,554,886	604.4	14.26
1926	438	271,060	2,376,583	44,606,310	584.1	16.20
1927	462	327,720	1,836,595	51,530,973	656.8	18.19
1928	485	305,325	1,908,148	54,792,896	659.2	20.30
1929	513	354,749	1,963,570	62,355,545	709.4	22.88

The action of the "Valio" is as intense as it is varied; it has set up an international commercial organisation with wide ramifications for marketing its butter. In many towns milk selling depots have been established and model dairies have been built which have handled 55 millions of litres of milk in 1928 and have turned out nearly 15,000 casks of butter. The Valio possesses a chemical-bacteriological laboratory, a dairy institute intended for the training of dairy instructors and managers and it has in addition organised special courses for the different branches of the industry. One section of the Union deals with the preparation of plans for the building of new dairy institutions and also functions as technical adviser as regards installation of machines, etc. The Valio has also carried out a very valuable piece of work in connection with grassland and pastureland improvement. For this purpose a number of instructors were engaged by the Union, and with their assistance experiment fields were established, the area of these being at present about 3,000 hectares. It should also be mentioned that the "Valio" collects and publishes annual statistics supplied by the co-operative dairies, and edits two technical reviews, one of which has a circulation of 50,000 copies.

The organisation of the Union "Valio" in its basic principles resembles that of other Central Co-operative agricultural unions. The supreme authority lies with the general meeting which appoints the 15 members of the council of administration. The managing body consisting of three members is elected by and from the Council.

The co-operative dairies associated in the "Valio" are expected to consign to it their entire production of butter, the Union paying the price two weeks after consignment whether the butter is sold or not. In the event of the price paid by the Union being too low, the dairy societies receive a supplement at the end of the season, or sooner. On the contrary, if the price has been too high, the Union meets the loss.

When the "Valio" began to apply the system of payment on the basis of the quality of the milk, no control had yet been established on the part of the State over butter intended for export, and it was only in 1913 that such an organisation was formed. This controlling organisation, the headquarters of which are at Hangö, the principal port from which shipments are made, is responsible for the inspection of the butter as regards odour, flavour, content in water, purity, keeping qualities, etc. The test with the object of ascertaining the degree of keeping power is made five times in the year without notice; the other tests are applied

whenever the special butter transport trains arrive at Hangö, on certain days of the week.

The result of the tests is communicated to exporters the next day, and on the day after the steamers which convey the butter to the different foreign markets are ready to get under weigh. The State inspection mark is applied only to butter which has been graded as first quality butter, and only such butter is allowed to be exported. Although the test of quality is always being made more severe, there is at present only a very small percentage which is not passed for export, as being of second or third class quality only. Of the total quantity of butter subjected to inspection during 1913, for instance, 59 per cent., was first quality, 32 per cent. second quality and 9 per cent. third quality, while the corresponding figures for 1927 were 95, 4 and one per cent.

The export of dairy products effected by the Union "Enigheten", which groups about 25 co-operative dairies in the part of Finland which is Swedish-speaking, is relatively small, although fairly considerable if compared with the export of butter made by private enterprises. The total turnover in 1928 amounted to about 43 millions of marks, 37 millions of which represented the equivalent of 22,000 casks of butter, or 11 million kg.

The Union "Enigheten" which is organised on the same principles as the "Valio" is also very active in regard to the improvement and development of the dairy industry by means of premiums, the publication of a review in Swedish on the dairy industry, grants in favour of instruction in dairy subjects, etc.

§ 5. THE CO-OPERATIVE RURAL BANK MOVEMENT IN FINLAND.

In origin and development there is a great similarity between the general movement for co-operation in Finland and the movement of the Finnish co-operative rural banks. Both have developed from the centre outwards on a preconceived plan. Thus in 1902, before there was a single co-operative rural bank in existence, a number of private individuals formed the Central Bank of the Co-operative Rural Banks (*Osuuskassojen Keskuslainarahasto*) with the object of supplying the local co-operative rural banks which were to be established with the necessary working capital. The capital necessary for the start of the Central Bank was provided by a State loan of 4 million Finnish marks on favourable terms as well as an annual subsidy of 20,000 marks for ten years (1). It was realised by the leaders of the newly started Finnish co-operative movement that until such a central institution was set up and supplied with the necessary funds it was useless to initiate propaganda for the foundation of local banks among the very poor Finnish farmers whose deposits would scarcely suffice to furnish their banks with the necessary working capital. The legislation of the time was influenced by the interests of joint stock and savings banks, and did not allow co-operative credit societies to accept deposits from other than members. Once the economic foundation was secured however, the Pellervo Society, as the Central organisation of Finnish co-operation assisted by the best possible experts, began in earnest to draw up standard rules suitable for Finnish conditions, book-keeping forms, manuals on the foundation and management of rural banks as well as on the accountancy methods to be adopted. When this preparatory work was finished a no less intensive informa-

(1) Pre-war parity 5.18 Finnish Marks = 1 dollar; present parity 30.70 Marks = 1 dollar.

tion propaganda was initiated in the press, which from the first was favourably disposed to the new movement, a propaganda which was also carried on by means of lectures and farmers' meetings on a large scale.

I. *Development of the Co-operative Rural Banks.* — The result of this work was that in 1904, one year after the foundation of the first local bank, 69 such banks were already in existence. Later, in 1912, when the movement was celebrating its 10 years' jubilee, there were not less than 400 banks, with a membership of 20,000 and a working capital of about 50 million Finnish marks.

The following years, up to 1920, were a period of relative retrogression as the result of the compulsory liquidation of a considerable number of local banks which had not been properly administered, of the withdrawal of the credit of the Central Bank and of the fact that the movement had incurred the distrust of the Russian authorities of those days.

An additional cause was, too, the abundance of money, which immediately after the world war in connection with the inflation flowed into the hands of the farmers. In spite of these hindrances the growth of the movement continued though slowly, also during this period. Each year on an average 20 new local rural banks were founded with the result that in 1918 there were in existence 606 with 29,000 members and a working capital of about 130 million Finnish marks.

From 1920 onwards there has been a period of extremely lively development, although the year 1929, when the rural banks as well as the other financial institutions of Finland were operating in conditions of great difficulty, was characterised by a certain set-back in more than one respect. At the end of 1929, there were in Finland 1415 co-operative rural banks, with 139,000 members and a working capital amounting to 1176 millions of marks. Out of a total number of 533 rural communes, at the end of 1928, there were only 57 not possessing a co-operative rural bank.

About one-third of the farmers in Finland are members of rural banks. The overwhelming majority of the members consists of small holders: 81 % (in 1928) owning 10 hectares or less of cultivated area; 18 % 10-50 hectares, and only about 1 % larger farms.

In addition to the individual members, the membership includes also a considerable number of other agricultural co-operative societies, rural communes and other associations. As regards size of membership the banks vary greatly; from a few dozen to several hundred. The average amounts to about 90 per bank.

The reasons for the very remarkable achievements of the co-operative rural banks movement in Finland in the years after 1920 are manifold. The Land Reform Law of 1918 had made it possible for the small farmers working on leased land to become independent owners on very favourable terms and during the last ten years there were in this way created more than 100,000 new freeholders. Naturally so long as all these farmers had their holdings on lease only, they had not been inclined to borrow money and sink capital in farms of which they were not real owners. On the other hand it is evident that from the point of view of the rural banks, lease-holders could not offer enough security for loans. With the land reform the conditions changed and new rural banks sprang up in commune after commune, giving the new independent farmers the opportunity of obtaining the necessary credit for the redemption and the amelioration of the farms.

The rationalization of agriculture — not least in the shape of electrification — the building of new co-operative dairies, the transition in the war and post-war years for great parts of the country from natural to money economy, are also factors which have called for new capital promoting the formation of new rural banks

and increasing their membership. It is in this connection especially interesting to note that as a result of developments of this order a great number of the larger farmers joined the banks, in which they were before very little represented.

The increased demand for credit could be met, thanks partly to the large loans on favourable terms given by the State to the Central Bank and partly to the right to accept deposits also from non-members, a right granted by a bill passed in 1920 both to the Central Bank and to local rural banks after necessary alterations made in their regulations.

Another important factor promoting the rural bank movement has been the high discount rate charged, owing to the scarcity of capital, both by the private and the savings banks (10-12 % or even more), which of course has increased the number of customers of the rural banks offering much cheaper credit.

As an additional stimulus to the co-operative credit movement in Finland in later years may be finally mentioned the granting since 1925 of long term credit in the form of mortgage loans, for which purpose the Government assigned a sum of 103 million marks to the Central Bank to be lent through the local co-operative rural banks to their members.

II. *Constitution and Administration of the Co-operative Rural Banks.* — The Finnish Co-operative Rural Banks, which according to their charter have to supply their members with credit on most favourable terms possible as well as with opportunity for safe deposit and accumulation of their savings, are organized in accordance with the well-known principles laid down for co-operative banks by Raiffeisen. The Finnish co-operative rural banks have only so far diverged in their activity from the principles of Raiffeisen that they have asked for and received State aid and that the entrance fees were fixed comparatively high. These fees were originally 60-100 marks, no small sum in pre-war money for the poor population among which the banks were founded; later, with the depreciation of the currency 100-300 and 300-600. Although these sums appear small they represent an amount not always easily found by many of the farmers entering the rural banks as members, taking into consideration that the average income of the members in 1928 only amounted to 9000 Finnish marks. The smallness of the membership fees does in no way endanger the solvency of the banks, which is chiefly based on the unlimited liability of all members for the obligations entered upon by their bank. The total value of the property owned by members, of which annual statistics are collected, amounted at the end of 1928, according to a low estimate, to approximately 8000 million Finnish marks, a sum many times higher than the indebtedness of the banks.

The administration of the co-operative rural banks is carried out by a Board of Administrators elected at a general meeting, consisting of five ordinary and three deputy members, each member having only one vote. For the current business of the bank the Board appoints an accountant who receives a fixed annual salary. As however most of these officials are able to perform their duties as spare-time work, the remuneration as a rule is kept very modest. For an accountant in the smaller banks who attends to the business only once a week, the remuneration usually does not amount to more than 500-1000 marks annually, including rent for the office. In banks requiring longer office hours, the salary may rise to higher amounts, giving the accountant a supplementary income of 4000-8000 marks. In the relatively few rural co-operative banks which wholly absorb the time of the accountant he of course receives an adequate salary. The smallness of the remuneration of the accountant, the honorarium, also very modest if any, paid by the banks to the members of the Board, and the fact that the offices are mostly situated in the home of the chairman or accountant or in schools or parish buildings, makes it compre-

hensible how it is that, as regards administration expenses, no other Finnish financial institutions are run so cheaply as the agricultural credit banks. It is also remarkable that, with the growth of the business in recent years, the administration expenditure has not risen in the same proportion. In 1925 it amounted thus to 0.74 % of the balance-sheet totals, in 1926 to 0.72 %, in 1927 to 0.65 %, in 1928 to 0.58 %, and in 1929 to 0.63 %.

The Board of Administrators meet in the case of most of the banks once a month. The office hours are regulated according to local conditions and the importance of the banking operations : relatively few are open every day, most of them only once a month (in these small banks, however, the accountant accepts deposits at any time), twice a month or once a week. The number of banks, having their office open every day, has however rapidly increased in recent times.

Usually the staff of the Finnish rural banks consists only of the accountant, who at the same time is also manager, cashier, correspondent and statistician.

Only exceptionally is any real part taken in office work by the chairman of the Board. At the beginning of the movement, attempts were made, following the example of Raiffeisen himself, to secure the help of the parish clergy for the direction of the rural banks in Finland. This has been largely accomplished in the Catholic countries, such as France, Italy and Ireland, but in Finland the plan did not meet with much success. At present the majority, or about two-thirds, of the accountants are farmers or farmers' sons, and about one-fourth are teachers.

III. *The Business Activity of the Co-operative Rural Banks.* — As already mentioned, the working capital of the co-operative rural banks is chiefly obtained from loans granted by the Central bank, deposits, membership fees and reserve funds. At the end of 1928 the working capital of the rural-co-operative banks amounted to over 1000 million Finnish marks of which 23.5 million is owned capital (share capital 9.6, reserve and available funds 13.9), 274.3 deposits and 726.9 loans from the Central Bank and, to a trifling extent however only, from other banks.

The greater part or over 70 % of the working capital comes thus from the advances of the Central Bank. The owned capital is relatively small and is increasing slowly owing to the smallness of the membership fees and to the fact that the annual surplus, the only source for augmentation of the reserve funds, is trifling, the margin of profit being kept very low. In 1927 the average margin between the interest paid by the banks on their own borrowing and the rate charged to members amounted only to $1\frac{1}{2}$ %, *i. e.*, less than in any other Finnish financial institution.

As already stated, the co-operative rural banks were up to 1920 by law forbidden to accept deposits from non-members, a fact that explains that in earlier years of the movement little importance was attached to the collection of deposits, the majority of the members being very poorly off. Especially after 1925, however, there has been a very rapid increase of the deposits, making it possible for the societies appreciably to meet the needs of the members from capital accumulated in this way. From 1927 to 1928 deposits increased by 118 million marks or 75 % and from 1928 to 1929, in spite of the difficult conditions affecting farmers during that year, by 75 millions or 27 %. Compared with other financial institutions the rural banks have only a very small portion, not even 3 % of the total deposits in the country.

The capital of the co-operative rural banks is chiefly used for loans, which are given to members only. Other investments are restricted entirely to the purchase of shares in the Central Bank, in proportion to credit enjoyed, and to bank deposits.

According to the law, 10 % of the deposits entrusted to a co-operative bank must be invested in bank deposits or safe, easily negotiable, bonds.

According to the Raiffeisen principles loans are only granted for productive purposes, specified in advance, *i. e.* for purposes likely to improve the economic status of the borrower. In case of larger loans a working plan drawn up by an expert is always requested. The rate and time of redemption are fixed separately in each individual case, and allowance is made for the purposes for which the loan is required. Inspectors appointed by the bank administration see that the objects, for which the loans have been granted, are actually carried out in conformity with the plan drawn up. Only farmers in well established economic positions, co-operative societies and associations, are granted current cash credits for business purposes less strictly defined. Owing to the fact that the number of communes, agricultural co-operative societies and other associations in recent years have become members of the rural banks, cash credit, *i. e.*, advances on current account, has increased appreciably. As seen from the table below there was up to 1928 a steady increase in the credits granted to the members. In 1928 they amounted in all to 799 million marks, of which 446 millions were given against bonds and 353 millions in the form of advances on current account.

During 1929 on the other hand, as a result of the depression of the money market the banks were obliged, as may be seen from the table, to contract within somewhat narrower limits credits given.

The Co-operative Rural Banks during the years 1925-29.

Year	Number of rural co-operative banks	Members (end of the year)	Owned capital	Loans from the Central Bank	Deposits	Loans to Members		
						against bonds	against promissory notes	Total
			mill. marks	mill. marks	mill. marks	mill. marks	mill. marks	mill. marks
1925	1233	95,419	9.6	274.0	46.1	155.9	50.9	206.8
1926	1344	108,763	13.3	394.1	82.4	272.9	83.6	356.4
1927	1399	115,814	17.9	536.6	156.5	319.7	190.2	509.9
1928	1416	131,045	23.5	726.9	274.3	415.8	353.3	799.1
1929	1715	138,762	30.4	790.0	349.0	373.8	373.8	747.3

The purposes for which loans chiefly have been granted in recent years are land reclamation, soil improvement and purchase of agricultural requisites. About 50 % of the credit granted has been used in this way. Building loans and purchase of live stock are represented by respectively 25 and 10 %. Since 1916, as already mentioned, the banks have also granted long term loans, first only for the purchase of new holdings, later on also for the acquiring of already established farms and additional land. In the years 1925-28 the loans thus granted numbered about 9,000 aggregating 56 million marks, for the purchase of new holdings and additional land, together representing an area of over 90,000 hectares. In 1925, the long-term credit business of the co-operative rural banks was, as already pointed out, greatly stimulated thanks to the State loan of 103 million marks granted to the banks and intended for mortgage loans to their members.

In order to show more in detail for what purposes the loans granted are used

and the results achieved, the following table is given. The figures refer to one single year only, 1928.

Land cleared for cultivation	11,071	hect.
New drains	6,269,245	metres
Materials for soil improvements	1,976,017	loads
Purchase of artificial fertilisers	126,631	sacks
» » seeds	1,353,300	kgs.
» » feeding stuffs	1,186,837	»
» » hay	3,089,289	»
» » machinery	7,144	items
» » cattle and horses	11,581	head
» » new holdings	7,032	hect.
» » additional land for 2,241 existing holdings . . .	19,536	»
Construction of new dwellings	3,225	build.
» » other new buildings	6,617	»
» » new accommodation for 27,252 head of cattle and horses	4,045	»

IV. *Inspection and Educational Work of the Rural Banks.* — The inspection of the co-operative rural banks, a work up to 1929 carried out by the Central Bank, is now entrusted by the State to the Central Association of the Co-operative Rural Banks (*Osuuskassojen Keskusliitto*), a body formed in 1928 in order to act as an educational centre for the agricultural co-operative credit movement. The country is divided into 20 inspection districts, each with one inspector domiciled in the district. In addition there are three chief inspectors. Each bank is inspected at least once a year. Inspection expenses are covered by a Government grant amounting in 1928 to nearly 1 million marks.

The inspection is very efficient thanks to the intimate collaboration between the inspectors and the Central Bank, which is empowered to withdraw credits granted from badly administered banks. On the whole, however, bank administration has been satisfactory. Since the beginning of the movement only about 50 local banks have been deprived of their credit and compelled to give up their activity, and only two of them have failed during all these years; their bankruptcy, however, in neither case causing the loss of a single penny to the Central Bank.

Besides the inspection work the Central Association also has taken over the vocational education formerly carried out by the Central Bank by means of courses, both oral and by correspondence. Some of the oral classes last for 3-4 weeks, and are especially intended for the education of accountants, others are of 2-3 days duration only. In its educational work the Central Association is assisted by the local associations of the rural banks, each covering an area of one or several communes. At the end of 1928 there were 79 such local associations with a membership of 596 rural banks.

From the very beginning one of the most important parts of the vocational education work of the rural banks has been the diffusion of co-operative and agricul-

tural knowledge among the members by means of periodicals, leaflets and books. Thus, it has for instance, been made obligatory for all those members, who have received loans, to subscribe to "Pellervo", a journal dealing with co-operation and agriculture and published by the central organisation of all the different kinds of co-operative societies in Finland. The result of this proviso has been that taking the year 1927 nearly 84,000 members of the rural banks were regular subscribers to "Pellervo". In the same year 9,000 members subscribed to other trade journals, while there were over 3000 subscribers to "Suomen Osuustoimintalehti", a co-operative journal published by the Central Bank, the Pellervo Society and the other central co-operative organisations for the guidance of the administrative bodies and of the officials of the co-operative undertakings. It may also be mentioned that the Central Bank and the Central Association last year started a new journal "Osuuskassalehti", entirely for the guidance of the officials of the co-operative rural banks.

V. *The Central Bank of the Co-operative Rural Banks.* — In the introduction to this article it has already been mentioned that before any single co-operative rural bank was in existence in Finland, the Central Bank of the Co-operative Rural Banks was established in 1902 as a share company by a number of private persons, agreeing to surrender their shares to the rural banks joining the Central institution as shareholders. The company charter forbade the Central Bank to grant loans to other than rural banks engaging to become shareholders in proportion to the credit enjoyed. From 1924 all the shares held by private individuals have been repurchased and surrendered to the rural banks.

The share capital, which has been raised on several occasions, is at present 40 million Finnish marks. The State, which in 1925 joined the Central Bank as a shareholder owns by far the greatest part of the company's shares (25 million marks) but is not entitled to any dividend. On the 15 million marks of shares held by the rural banks the maximum dividend of $4\frac{1}{2}\%$ is paid. The owned capital of the Central Bank amount to 70 million marks.

The highest administrative organ of the Central Bank is the Board of Administration, with 12 members, of whom the Bank of Finland, the Ministries of Finance and Agriculture each nominate one and the local rural banks nine. The highest number of votes which a shareholder can have at a general meeting is six, a stipulation, which, although the State is the largest shareholder, secures the majority vote to the rural banks. The current business of the Central Bank is entrusted to a Board of Directors, consisting of a managing director and four other members. For the control of the activities of the Bank the Government appoints a public controller.

The purpose of the Central Bank is to satisfy through loans granted to the co-operative rural banks the credit needs of members of the said local banks, special attention being devoted to small farmers. In addition the Central Bank is also entitled by its charter to grant loans directly also to other co-operative societies and associations, rural communes, parishes, congregations, etc. In practice, however, loans to these categories of borrowers are usually made through the local rural bank, of which of course the society or association, etc., must be a member.

The demands of the rural banks for credit from the Central Bank have been met by raising loans and by accepting deposits. Only in recent years, however, has this latter method contributed in any appreciable way to the working capital, as up to 1920 the Central Bank, as already mentioned, had no right to accept deposits from other than member-societies, entitled in their turn to credit. By far the largest part of the working capital is raised by loans, State loans, loans

from the Bank of Finland, from the Postal Savings banks, on Government security, and since 1926, from abroad (short time loans).

The indebtedness of the Central Banks at the end of the years 1925-29 is shown in the following table.

*Indebtedness of the Central Bank of the Co-operative Rural Banks
at the end of the years 1925-29 (in million marks).*

	1925	1926	1927	1928	1929
Government loans	97.4	156.9	216.6	245.1	271.4
Loans from the Bank of Finland	25.0	86.6	9.9	75.0	63.6
Bonds and other loans	101.9	180.5	223.3	287.7	347.6
Deposits	23.2	39.8	63.2	93.4	78.6
Total	347.5	385.8	513.0	701.2	761.2

The loans granted by the Central Bank to its members are in the form of advances on cash credits, bond loans, discounting of bills (since 1923) and long term amortization loans out of which latter the rural local banks grant similar loans to co-operative societies and, against mortgage security, to individual farmers. Among these various forms of loans, the advances on cash credit form the largest group.

The progress in the amount of credits granted during the five-year period 1925-1929 is shown in the following table.

Years	Credit granted to co-op. rural banks	Credit granted to other co-op. societies	Total
	(million marks)		
1925	272.0	3.7	275.7
1926	389.7	9.5	399.2
1927	530.6	18.3	548.9
1928	720.4	41.4	761.8
1929	780.3	47.4	827.7

In recent years the business done by the Central Bank has been rapidly increasing. The balance-sheet total rose thus from only 17 million marks in 1920 to 848 millions at the end of 1929 and the turnover in the same time from 160 million marks to nearly 16,000 millions.

In spite of the increase in the business of the Central Bank its profits have remained very modest; in 1929 for instance they amounted to 3.1 million marks only. This is due partly of course to the fact that the bank does not practise those forms of banking business which may result in great market gains, but chiefly to the fact that it is its first duty to provide the members with loans at the lowest possible rates.

§ 6. CO-OPERATIVE PURCHASE OF AGRICULTURAL REQUISITES.

At the present time there are in Finland two co-operative wholesale unions for the purchasing of agricultural requisites and equipment, *viz.* "Hankkija", which is active among the Finnish-speaking population, and "Labor" with activities confined to the Swedish-speaking section.

The agricultural purchasing union "Hankkija" was founded in 1905, and at present, since 1921, accepts as members only co-operative organisations and not individuals. In 1929 this Union grouped 347 consumers' co-operative societies, 193 co-operative dairies, 355 rural co-operative banks, 27 other co-operative organisations and communal undertakings, 62 agricultural societies (*lantmannagillen*), and 233 private individuals, whose membership dates to the period before the alteration of the rules; in all accordingly 1,217 members. The turnover of the Union for 1928 amounted to 377 millions of marks, but dropped in 1929 by a little more than 10 per cent., *i. e.*, to 338 millions, in consequence of the unfavourable agricultural situation of that year. For the same reason, the profit was considerably reduced, from 71 millions of marks in 1928 to 4.3 millions in 1929. The large majority of the sale transactions (75 to 80 per cent.) are with the co-operative consumers societies and the co-operative dairies, while the rural co-operative banks are mainly regarded as auxiliary members. Of the net annual surplus, 60 per cent. goes to the reserve fund (until that fund has reached a total of 100 millions) and ten per cent. to the current funds. After the distribution of the 1929 surplus the total funds of "Hankkija" amounted to 33 millions of marks, including 23 millions of reserve fund and working capital, 1.3 millions of share capital and 5.3 millions guarantee fund. As the Union works with a very narrow margin of profit, there is no profit sharing. Credit is allowed to customers only to a very limited extent and in a few years' time it is hoped that the principle of payment in cash will be universally followed. The Union "Hankkija" like other co-operative wholesale organisations, introduces purchasers requiring credit to the agricultural credit institutions, rural co-operative banks and savings banks.

The supreme authority in the Union is the general meeting in which each member has a vote. The general meeting elects the administrative council of 15 members, which in its turn appoints the management which consists of 5 members.

The activity of "Hankkija" is distributed over seven sections: the fertiliser and feeding-stuffs section, cereals section, and the sections for seeds, farm machines, electricity, education and accountancy.

The cereals section undertakes the purchase of the members' cereals, and their resale to private mills or to co-operative societies for a small commission; the section itself taking the credit risks.

After 1913 the Union "Hankkija" took up the improvement of seeds, but in 1916 transferred the work to a farm enterprise purchased for the purpose and known as "Tammisto", an establishment which has gained a reputation even beyond the borders of Finland for its excellent work. Farmers also contract to grow seeds obtained from Tammisto, and the area under cultivation in this way in 1929 was nearly 1,300 hectares. Up to 1913 the Union "Hankkija" made all the grants necessary for this work of seed improvement, but from that year onwards it has received a subsidy from the State of 300,000 marks per annum.

"Hankkija" has also its own grading plant for seeds and its own nursery, and the seeds section sells the products of the nursery as well as those of the seed improvement establishment. This section by means of lectures and publications does

considerable educational work among farmers on seed questions. All the seed improvement activities of "Hankkija" are under the supervision of the State department for seed control.

The farm machine section, which in its sphere is the most important technical bureau in Finland, sells agricultural machines, draws up plans and carries out installations. On the twentieth anniversary of the foundation of the "Hankkija" Union it was reported that the machine section had planned and equipped with machinery 300 dairies, 350 flour mills, 200 large saw-mills and several small saw-mills for domestic requirements, as well as 50 other establishments connected with agricultural production, such as desiccators, etc. The machine section has the general agency business for the more important foreign firms and itself turns out, on its own premises, threshers, straw-cutters, boilers, etc.

According to an agreement signed in 1915 with ten of the regional Unions of dairy societies, "Hankkija" was made responsible for supplying all machinery and all other equipment required by the dairies affiliated to these unions, which on their side undertook to make all their purchases of this kind from the "Hankkija".

The electric section which was in 1916 separated from the machine section has carried out the greater part of the electrification of the country side in Finland. Up to 1925, at the time of the 25th anniversary of the foundation of the Union, the section had constructed 215 electric power works, 6000 kilometres of conducting cable and 750 transforming stations. During 1929 alone 98 transforming stations were constructed and 632 kilometres of new conducting cables.

The education section devotes itself especially to providing courses for the instruction of the managers and staffs of rural co-operative deposits in the trade in agricultural requisites; it also undertakes to organise special courses, motor courses, courses in electricity etc., and lectures on co-operation. In 1929, 150 lectures were delivered attended by more than 30,000 persons. The Union does not itself publish reviews, but collaborates in the publication of the reviews published by "Pellervo" and the other central co-operative organisations.

At the present time, the Union "Hankkija" handles 40 per cent. of the sale of fertilisers in Finland, 30 per cent. of the sale of stockfeeds, and from 60 to 70 per cent. of the wholesale trade in seed.

The proportion of the wholesale trade in farm machines and in dairy machinery effected by the "Hankkija" out of the total sales all over Finland is respectively 45 and 90 per cent.

As already stated, the Central agricultural co-operative union "Labor" is the central organisation corresponding to "Hankkija" in the Swedish-speaking regions of Finland. This central union which was founded in 1897 had a membership in 1928 of 1092, including 131 organisations and 961 individual members, and a turnover of 120 millions of marks. "Labor" purchases cereals from members, mills them in its own flour mill before resale, sells fertilisers and stockfeeds, machines, building materials, etc. It also undertakes installation of machinery, and has its own establishment for seed control. Its educational section published the periodical "Labor" and organises lectures and vocational courses. The general organisation of the Union is on the same lines as that of "Hankkija".

§ 7. OTHER AGRICULTURAL CO-OPERATIVE ORGANISATIONS.

Co-operative societies for sale of livestock and co-operative slaughter houses. — Co-operation for sale of livestock and co-operative management of slaughter-houses are of more recent date in Finland than co-operative dairying, and the same degree

of development has not been attained. The co-operative slaughter-house societies, the first of which was founded in 1909, usually serve extensive districts, often a whole province; the membership is relatively restricted, and at the present time does not exceed 5000 individuals and 30 societies.

The co-operative slaughter house societies in the first instance confined their activity to the sale of live animals, but by degrees this activity became widened and at the present time the societies own 15 co-operative slaughter-houses, four of which are engaged in the export trade and 10 are factories of pork products. In addition the societies own a few other establishments. The total production, in 1928, was about five and a half million kilos of meat, resulting in a total turnover of 100 millions of Finnish marks.

A certain number of societies for the sale of livestock, co-operative dairies, etc. formed in 1928 a central organisation, known as the Finnish Central Co-operative Union for Sale of Livestock (*Suomen Karjakeskuskunta*) which began activity in 1919. The number of co-operative societies thus associated in 1929 were 34. At the present time this central co-operative union owns three wholesale trading centres, three pork product factories, and a large number of depots for the retail sale of pork products and slaughter house products. The turnover of the Central Co-operative Union, which also handles consignments of live stock of non-members, amounted in 1929 to 107 millions of marks, representing the value of about five million kilos of meat.

Co-operation for the sale of eggs. — Poultry-keeping was little developed before the war and the value of the annual importation of eggs amounted at that time to nearly two millions of Finnish marks. The first endeavours to develop this branch of agricultural industry, and to organise egg markets through the dairy societies, the consumers' co-operative societies and similar organisations, met with little success, owing to the fact that these organisations did not give enough attention to the quality and to the packing of the eggs. It was for this reason that in 1913 the groups of persons concerned took the initiative of forming special co-operative societies for the sale of eggs, which have been able to report a great development of activity. During 1928, there were in Finland 95 societies of this type, with a total membership of about 7000, and a turnover of 13 millions of Finnish marks.

Following on the initiative of the Pellervo Society, 15 local co-operative societies for sale of eggs were formed in 1921 into a central exporting organisation "Muna" which began operations in 1922. This organisation had in 1929 a membership of 152 societies, a turnover of 9 millions of marks and a net profit of 162,000 marks.

Forestry Co-operation. — Some local co-operative saw mills combined in 1921 into a Central Co-operative Association of Forest Owners (*Metsänomistajain Metsäkeskus*) which mainly undertook to find trade outlets for forestry products, to supply the mills with modern machinery, to give advice on the transformation of forestry products, to instruct the staff of the saw mills, etc. During 1928 nearly 4500 forest owners were directly, or through their society, affiliated to this central organisation. The turnover for the same year amounted to 88 millions of marks, the larger part representing the export business. The organisation has in eight Finnish ports its own quays, warehouses and all equipment for the shipping of the products.

As regards the other co-operative organisations of farmers, mention should be made of the co-operative societies for farm equipment, numbering 450 in 1928 with 4500 members; co-operative peat working societies numbering 165 with 4100 members, which supply farmers with the material needed for litter for stock and for

isolation purposes in buildings, etc., also co-operative societies for the joint maintenance of breeding animals, bulls, boars, etc. Of these latter there were 380 with a membership of 5200. In addition 190 co-operative milling and electricity societies were carrying on work in 1928 with 9,500 members, apart from 54 mills belonging to the co-operative dairy societies. These latter also worked on their own account 22 saw-mills. The telephone systems in the rural communes have been usually installed by co-operative telephone societies. In 1928 there were 250 of these with 12,800 members.

H. L.

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FARM ECONOMICS

Some Results of the Comparative Statistical Study of Farm Accountancy Data in certain Countries for 1927-28 (*concluded*).

CONCLUSION.

Farm accountancy is the written record of the vital phenomena of the farm. The consideration of the results of statistics based on the farm accounts of 16 countries of Europe for 1927-28 has proved this dictum, and enables us to say with Prof. HOWARD (1) : " It is clear that the fundamental object of farm accountancy is to reproduce a true picture of the farm in all its detail ". This object is in part attained. The figures contained in the tables show as, has been seen, the general tendencies and reflect the position of agriculture in the countries and regions under review.

It is natural to ask oneself at this point what advantage will be gained from the annual establishment of an international statistic of farm accountancy results since " farm accountancy ", to quote M. PFANNENSTIEL, Director of the Institute for Agricultural Education at Oranienburg (2), " has gone no more than half way, if its function is accomplished with the closing of accounts ".

(1) HOWARD : Was vermag eine gute Buchführung dem Landwirte zu lehren, Leipzig, 1898.

(2) PFANNENSTIEL : Böchführung und Wirtschaftsberatung, Berlin, 1928.

TABLE 19. — *Comparative test for five European countries of the*

	Switzerland					Denmark				
	1924/25	1925/26	1926/27	1927/28	1928/29	1924/25	1925/26	1926/27	1927/28	1928/29
ber of farms	436—	460—	473—	500—	504—	671—	705—	690—	726—	754—
age area of farms	14 39	14 42	14 30	14 30	14 66	43 50	45 30	44—	43 70	42 90
assets per ha, money of the country	7777—	7139—	7147—	7048 73	7749—	2691—	2777—	2666—	2454—	2420—
" " gold francs	7777—	7139—	7147—	7048—	7749—	2434 03	3493 32	3675 94	3403 83	3353 32
rest on assets, money of the country .	332 85	349 60	352 60	357 43	348 62	130—	135—	129—	118—	117—
" " gold francs	332 85	349 60	352 60	357 43	348 62	117 58	169 82	177 87	163 74	161 92
s return per ha, money of the country	1304 31	1280 01	1200 32	1219 67	1258 67	1235—	880—	767—	775—	851—
" " gold francs	1204 31	1280 01	1200 32	1219 67	1258 67	1117 07	1107—	1057 50	1075 44	1177 74
ning costs per ha, money of the country	1113 61	1115 25	1096 21	1095 69	1072 05	989—	836—	732—	731—	700—
" " gold francs	1113 61	1115 25	1096 21	1095 69	1072 05	894 56	1057 65	1009 30	1014 37	968 77
return per ha, money of the country .	190 70	164 76	104 11	123 08	186 62	246—	44—	35—	44—	151—
" " gold francs	190 70	164 76	104 11	123 08	186 62	222 51	55 35	45 26	61 07	208 96
" " in % of farm assets . . .	2 63	2 33	1 70	1 99	2 63	9 10	1 60	1 30	1 80	6 20
fit (for loss) on total farm assets per ha.: " " money of country	—146 01	—184 84	—248 49	—233 45	—162—	+ 116—	— 91—	— 94—	— 74—	+ 34—
" " gold francs	—146 01	—184 84	—248 49	—233 45	—162—	104 92	—114 47	—129 60	—102 67	47 05
ie as percentage of the assets	— 1 88	— 2 59	— 3 48	— 3 31	— 2 09	4 31	— 3 23	— 3 52	— 3 01	— 1 40
ie as percentage of gross return	— 11 19	— 14 45	— 20 70	— 19 14	— 12 87	9 39	— 10 34	— 12 25	— 9 55	— 8 90
rage exchange rate at New York for the arming year	—	—	—	—	—	17 4527	24 2726	26 6010	26 7751	26 7000
ctor of transformation (1)	—	—	—	—	—	0 90451	1 25795	1 37882	1 38765	1 33395
<div style="text-align: center;">average rate parity between dollar and francs (19 2953).</div>										

In the course of this study, mention has been made of agrarian reform and agrarian policy; the subject will not be returned to here. It appears that the benefits of such a statistic will be felt in the first place by science and by agricultural education. As already pointed out, farm accountancy is on the way to becoming the most important empirical basis of the science of rural economy, since many of the doctrines of this science are built up on the results of farm accountancy. "A large part of the knowledge" — to quote Pfannenstiel once more (1) — "gained in the course of any practical occupation and particularly while following the agricultural callings, is the outcome of comparisons. How has one learnt to distinguish between a good and a poor piece of land, to judge a head of livestock; only by means of comparisons drawn from abundant material. The head of a farming enterprise learns more quickly to measure the success of his enterprise if he places side by side with the results of the working of his own farm the results obtained by the 20 or 30 farms of his district which are most like his own".

Thus the science of rural economy can be enriched by a documentation on a wider scale. The main body of the farmers will reap the advantage of the results through the medium of agricultural instruction. As heading of all *Recueils* of

(1) PFANNENSTIEL: loc. cit.

general averages of the principal results for five successive years.

Norway					Sweden					Finland				
1924/25	1925/26	1926/27	1927/28	1928/29	1924/25	1925/26	1926/27	1927/28	1928/29	1924/25	1925/26	1926/27	1927/28	1928/29
127 —	145 —	168 —	190 —	172 —	262 —	300 —	346 —	400 —	374 —	363 —	382 —	426 —	489 —	546 —
18.78	18.46	18.46	17.26	16.60	75.68	75.11	66.73	60.87	72.58	25.80	22.87	25.46	29.48	26.83
4148.36	4372.92	4244.95	3993.41	3925.07	1546 —	1527 —	1550 —	1590 —	1579 —	8186 —	8616 —	8975 —	9710 —	10,596 —
3088.41	4369.34	5187.66	5448.30	5434.73	2144.17	2121.20	2149.20	2212.53	2189.04	1064.74	1127.43	1174.83	1268.19	1383.90
231.08	179.40	174.96	203.10	161.29	83 —	82 —	83 —	85 —	84 —	650.88	639.28	718 —	824.06	893.66
172.04	179.25	213.79	277.10	223.32	115.11	113.91	113.08	118.28	116.45	85.18	90.19	93.98	107.62	117.36
1089.78	864.90	705.05	698 —	680.43	370 —	404 —	391 —	397 —	412 —	2428 —	2631 —	2720 —	2826 —	2862 —
774.10	864.10	861.53	952.29	942.21	515.16	561.21	542.15	552.44	571.18	317.75	344.27	356.05	369.15	373.81
831.02	831.38	702.78	681.80	604.03	356 —	361 —	357 —	375 —	375 —	2026 —	2132 —	2284 —	2365 —	2546 —
618.6	830.70	858.75	892.12	896.35	493.74	501.47	495.01	521.83	519.88	265.14	278.95	298.87	308.88	332.51
208.75	33.52	2.27	66.10	76.45	14 —	43 —	34 —	22 —	37 —	402 —	400 —	436 —	461 —	316 —
155.41	53.49	2.77	90.17	105.85	19.42	59.73	47.14	30.61	51.30	52.61	56.29	57.08	60.27	41.30
5.03	0.76	0.05	1.66	1.95	0.90	2.80	2.20	1.40	2.30	4.90	5.80	4.90	4.75	2.95
— 22.33	— 145.88	— 172.60	— 137 —	— 84.84	— 69 —	— 39 —	— 40 —	— 63 —	— 47 —	— 248.88	— 190.28	— 232 —	— 362.62	— 582.34
— 16.62	— 145.76	— 211.02	— 186.93	— 117.47	— 95.70	— 54.17	— 67.94	— 87.67	— 65.16	— 32.37	— 24.90	— 36.90	— 47.35	— 76.65
— 0.54	— 3.33	— 4.07	— 3.43	— 2.16	— 4.46	— 2.55	— 3.16	— 3.96	— 2.97	— 3.05	— 2.21	— 3.14	— 3.73	— 5.49
— 2.15	— 17.54	— 24.49	— 19.62	— 12.47	— 18.64	— 9.65	— 12.50	— 15.86	— 11.41	— 10.25	— 7.23	— 10.37	— 12.83	— 20.30
14 3652	19 2795	23 5777	26 3249	26 71666	26 7609	26 8036	26 7545	26 8499	26 750	25 251 37	25 24 867	25 25 754	2 519 999	2 519 909
0.74449	0.99918	1.22104	1.36432	1.38462	1.38691	1.38913	1.38653	1.39153	1.38635	0.130868	0.130854	0.130900	0.1306017	0.1306017

national or international agricultural statistics there may be placed this motto: "Practice learns from Practice". Progress on these lines will be made easier by the regular agricultural advisory services initiated in Germany the value of which is becoming increasingly recognised in other countries. The farm adviser will compare the accountancy results of the farmers who apply to him for advice with the results of farms similarly situated and worked on similar lines. He will tell them if their expenditure on labour, fertiliser, or forage is too low or too high to secure normal returns per hectare. Such a comparison, however, will be greatly facilitated if he has also knowledge of returns obtained by farms situated in other countries and in conditions either very similar or very dissimilar. Knowledge of this kind will throw light upon many an obscure point and will render his advice more authoritative.

The full value of the results contained in the *Recueil* can only be realised at the end of a period of years, when they will reproduce the changes in the position of agriculture in a group of countries and production regions. So as to make this plainer, there are shown in Table 19 the main results for five successive years in five countries: Switzerland, Denmark, Norway, Sweden and Finland.

The number of farms the accounts of which have been surveyed by the Accountancy Offices in each of these countries has not varied from 1924 to 1928; the average area has remained practically the same. Statistical results are always the closer to reality the larger the number of averages taken. As has been noted by

TABLE 20 - Variations around the average serving to establish the curves.

	Farm assets per ha					Gross Return					Farming Costs					Net Return								
	Variations around the average					Variations around average					Variations around average					Variations around average								
	Average					Average					Average					Average								
	value	1924/25	1925/26	1926/27	1927/28	value	1924/25	1925/26	1926/27	1927/28	1928/29	value	1924/25	1925/26	1926/27	1927/28	value	1924/25	1925/26	1926/27	1927/28	1928/29		
Switzerland . . .	+ 7372.14	+ 404.53	- 225.15	- 22.74	- 225.42	+ 376.68	- 12.22	+ 51.71	- 27.43	- 12.23	- 2.92	- 0.68	+ 1028.36	+ 15.05	+ 16.65	- 2.35	- 2.85	- 25.35	+ 1.403	- 36.67	- 10.70	- 49.03	- 30.06	+ 22.50
Denmark	+ 2692.20	+ 55.70	- 174.80	+ 64.20	- 145.20	- 113.20	- 90.60	+ 33.40	- 21.00	- 174.00	- 135.00	- 46.00	+ 7.60	- 181.40	+ 33.40	- 6.00	- 66.60	- 97.00	+ 104	- 142	- 80	- 60	- 60	+ 47
Norway	+ 4136.01	+ 11.42	+ 235.36	+ 105.00	- 115.15	- 211.27	+ 77.74	+ 242.14	- 67.30	- 92.50	- 66.61	- 117.16	+ 720.22	+ 110.60	+ 111.16	- 17.45	- 68.32	- 116.10	+ 77.42	- 131.34	+ 43.90	- 70.15	- 11.32	- 0.67
Sweden	+ 15.8.40	- 12.49	- 21.49	- 3.40	+ 31.91	- 20.60	- 64.80	- 24.50	+ 9.20	+ 3.00	+ 1.20	- 17.20	+ 264.20	- 8.90	- 3.90	- 7.90	- 10.20	+ 10.20	+ 90	- 10	+ 13	+ 4	- 8	- 7
Finland	+ 9206.70	- 1070.70	- 607.70	- 221.70	- 303.70	- 1526.60	+ 2828.34	- 95.34	- 62.64	+ 20.34	+ 132.05	- 165.30	+ 2270.61	- 144.61	- 136.61	- 13.61	- 94.60	- 276.60	+ 429.60	- 24.60	- 70.60	+ 18.05	+ 33.48	- 109.60

	Net Return in % of assets					Profit or loss on total farm assets					Profit or loss on total farm assets in % of assets					Profit or loss on total farm assets in % of gross return								
	Variations around the average					Variations around average					Variations around average					Variations around average								
	Average					Average					Average					Average								
	value	1924/25	1925/26	1926/27	1927/28	value	1924/25	1925/26	1926/27	1927/28	1928/29	value	1924/25	1925/26	1926/27	1927/28	value	1924/25	1925/26	1926/27	1927/28	1928/29		
Switzerland . . .	- 2.26	+ 0.81	+ 0.97	+ 0.27	- 0.27	- 0.30	- 184.99	+ 48.90	+ 10.12	- 53.54	- 27.91	- 32.90	- 2.07	- 0.70	+ 0.08	- 0.31	- 0.66	+ 0.38	- 1.67	- 4.43	- 1.12	- 0.03	- 3.47	+ 2.60
Denmark	- 4	+ 0.10	- 2.40	- 2.70	- 2.30	- 2.20	- 21.20	+ 137.20	- 69.20	- 72.30	- 1120	- 60.80	- 0.61	- 0.18	- 2.40	- 2.70	- 2.10	- 2.22	- 2.76	- 19.16	- 0.40	- 8.60	- 6.90	- 7.74
Norway	+ 1.59	- 0.14	- 1.11	- 1.94	- 0.73	- 0.06	- 112.50	+ 90.22	- 35.23	- 60.34	- 24.41	- 27.70	- 1.70	- 2.17	- 0.61	- 1.26	- 0.72	- 0.30	- 1.26	- 10.11	- 2.91	- 0.34	- 4.20	+ 2.70
Sweden	+ 1.92	- 1.07	- 0.88	+ 0.23	- 0.37	- 0.38	- 65.40	- 1.00	- 14.40	- 4.40	- 0.06	- 6.60	- 0.42	- 1.64	+ 0.87	- 0.26	- 0.13	+ 0.10	- 13.01	- 0.03	- 3.06	- 1.12	- 2.25	+ 2.20
Finland	+ 4.60	+ 0.33	- 1.14	+ 1.23	+ 0.30	- 1.04	- 326.20	- 84.60	+ 142.05	+ 51.02	- 25.00	- 249.30	- 2.17	+ 0.47	- 1.82	+ 0.30	- 0.21	- 1.97	- 12.18	- 1.30	- 4.97	- 1.83	- 0.64	- 5.11

the Secretariate of the Swiss Peasants at Brougg (1), "when the number of farms is large enough, the calculated averages vary only to a trifling extent when the data of other farms are added. For example the following are two farming results, as they were in 1922, according to the number of farms included under the statistics :

Average	Net return in % of the farm assets	Household expenses per day per man
84 farms	- 1.90	2.20
114 "	- 1.71	2.42
154 "	- 1.73	2.43
204 "	- 1.88	2.44
234 "	- 1.74	2.43
274 "	- 1.65	2.44
313 "	- 1.60	2.45
400 "	- 1.62	2.46

"Although the survey of accounts did not follow any special order, it will be seen that if 100 or more farms are grouped, the averages do not noticeably vary. This test is applied each year.

"The influence of a determined result when added to an average already established is called a *natural variation* and may be determined by means of the *calculation of probabilities*. This calculation has been made by Dr. Pauli; he has arrived at the conclusion that in a group representing at least 15 individual results, the natural variations due to the influence of the results of other units added to the group balance each other, and that consequently it is possible to draw definitive conclusions from the average of the 15 results on any determined point and to apply these conclusions in practice. Evidently, in theory, these natural variations might be taken into account in working out any statistical average of a term of the form $\pm x$. This rectification would not however usually have any practical importance, and it is perfectly in order to neglect it in establishing group comparisons.

"Although each year investigations into profit-earning capacity include a certain number of fresh farms while other farms fall out, the average composition of the farms surveyed remains the same under the different relations (area, degree of intensive farming, etc.). It is thus possible to establish safe comparisons, equally between the general averages as between those of each group of farms. Every annual average plays the part of relative average in the total of countries, and may be compared with that of another year. In this way the averages of the Secretariate render it possible to form an increasingly precise idea of the true conditions of Swiss agriculture".

(1) *Zurück Fritz. Les Recherches du Secrétariat des Paysans Suisses sur la rentabilité de l'agriculture. Brougg 1924.*

These conclusions of the Peasants' Secretariat are applicable to the results of the four other countries under review, and in fact support the conclusions reached after placing side by side, in the study of the gross return, the percentages of the cultivable area taken from the *Recueil* and from the *Year-book of Agricultural Statistics*. The farm assets per hectare does not vary in any perceptible extent. The differences appear more clearly when the original figures are transformed into gold francs and when the exchange medium undergoes any considerable variations, as was for example the case of Norway and Denmark in the years 1924-25 and 1925-1926. But with a stable exchange, the series of results in gold francs follow approximately the same curve as the same series in money of the country.

To avoid the influence of exchange variations on the results, use has been made, in establishing, on graph XIII and following graphs, the curves of variation round the average of the principal results, of the series of figures in the money of the country itself.

It is obvious, as has been several times repeated in the course of this study, that the comparative study of the financial results of Table 19 will be confined to the general tendencies of agricultural development in the five countries under review. No direct comparison will therefore be made between the 41.30 gold francs which represent the average net return of the Finnish farms in 1928-29 and the 186.62 gold francs representing in the same year the average net return of the farms of Switzerland; in consequence of differing conditions, the values expressed by these figures do not exactly correspond.

The curves of gross return and of farming costs shown on graph XIII prove that the situation of agriculture during the five years under review was characterised by the same tendencies in Switzerland, Denmark and Norway. Sweden and Finland form a group apart with tendencies that are similar but differ a little from the preceding. It has been shown earlier that agriculture in Sweden and Finland is in a special position as regards natural and economic conditions; stress has been laid on the very high percentage of the area reserved for forests and grazing lands. Sweden and Finland are countries which are exporters of animal products, while in Norway, for instance, there is home consumption of these products. Many other causes have determined these differences, such as price formation, purchasing power, tariffs, etc.

In Switzerland, in Denmark and in Norway, the curve descends from 1925 to 1927; in Sweden and in Finland, on the other hand, the position, which had strengthened in 1925-26, was more precarious in 1926-27 becoming more favourable again in 1927-28. The ascending curves of the gross return and the descending curves of the farming costs which show, as proved by graph XIII, that the net return has increased, indicate that the agricultural situation somewhat improved in 1928-29 in all the countries except Finland. For this country the graph shows a much more precarious situation, possibly in part due to an increasing need for agricultural credit. This situation will be more unfavourable in 1929-30 and in 1930-31. The number of sales due to bankruptcy have continued to increase.

In all the later graphs the curves of variation preserve the form already indicated. The curves of net return, and of the profit or loss on total farm assets, on graphs XIV and XV, are almost exactly parallel, except for the year 1927-28 in Finland, where the farm assets, and in consequence, the interest reckoned on them, rose sharply. In general, from one year to another, the capital invested in agriculture and the interest rates reckoned on it by the Offices do not undergo any appreciable variation. For the same reason, the curves of net return and of profit or loss on total farm assets in percentage of the assets shown on graph XVI

are also parallel. In Denmark the smallest difference occurs between the net return actually obtained and the normal net return, *i. e.*, the return that the capital would have given if invested in another enterprise at the usual rate, this difference constituting the profit or loss on the total farm assets. It is the only country in which this difference in 1924-25 and in 1928-29 is even positive and the only country where the net return measured in percentage of the farm assets attains a very high figure, *viz.*, 9.1 per cent. in 1924-25 and 6.2 per cent. in 1928-29. Now, the rate reckoned by the Office for lands is 4 per cent., on buildings is 5 per cent., and on tenants' capital is 6 per cent, rates which very nearly correspond to the usual rate, so that it may be said that the capital would in 1924-25 and in 1928-29 have yielded a less interest if it had been placed in a bank.

Finland, in consequence of the unfavourable credit conditions mentioned above, is the country where the difference is the greatest between the net return and the profit or loss on farm assets both measured in percentage of the assets. This appears from the following figures :

Country	Average difference between the net return and the profit or loss on the farm assets, both expressed as percentage of the assets
Switzerland	4.93
Denmark	4.82
Norway	4.59
Sweden	5.34
Finland	8.18

The curves of graph XVII have the same form as those of the other graphs. The average percentages show however that in Switzerland and in Norway the cost prices are highest, and that in Denmark they are lowest. In other words, in order that the gross return may cover precisely the cost of production, it would have been necessary to raise on the average from 1924-25 to 1928-29 the selling prices of farm products, in Switzerland by 15.67 per cent., in Norway by 15.25 per cent in Sweden by 13.61 per cent., in Finland by 12.19 per cent., and in Denmark by 3.75 per cent. In this latter country, the selling prices of farm products would have had to be reduced respectively by 9.39 per cent. in 1924-25 and by 3.99 per cent. in 1928-29 to allow of the cost of production being exactly covered by the gross return. The very low cost prices of Danish butter made it possible to export to Switzerland, for instance, at a price which withstood all competition and decided the Swiss authorities to raise the entrance duty on the product. This example shows clearly the value to international price policy of the statistical establishment for all countries of the profit or loss on the total farm assets in percentage of the gross return.

It will accordingly be noted that, for each of the five countries under review, the curves of variation of the gross return, of farming costs, of net return and of the profit or loss on the total farm assets, equally in absolute figures per hectare as in percentage, take the same form and reflect the general tendencies and the situation of the agriculture of each. Anyone however who desires to draw conclu-

sions from these, without running the risk of their being erroneous, should have a thorough acquaintance with the conditions governing the figures on which the conclusions are based. On the other hand, these conclusions have their full value only when they are mutually compared, and it would be a mistake to try to obtain a single figure embracing the results of all the countries; their whole significance might disappear in the course of such equalisation. These latter tables and graphs have shown more clearly than ever that in order to obtain figures presenting any approach to exactitude, the average results of a period of at least five years must be available; since it appears, *inter alia*, from Table 20 that the variations round the average are sometimes very considerable, and that the results of a single year cannot give a true picture of the situation of agriculture in a region of production or in a country. Unfavourable circumstances which may in the course of a single farming season modify the character of the agriculture of a region or of a country can be counterbalanced by favourable influences only at the end of a period of at least from five to ten years. The average obtained then may be considered as fixed, if the economic conditions remain normal. The following example, taken from the Report of the Secretariate of the Swiss Peasants, seems to show this:

Period —	Net return per hectare —	Net return in % of the assets —
1923-27	175	2.55
1923-28	176	2.57

In a word, if it is desired to utilise with profit, whether year by year or after a certain number of years, the results of the "Recueil de statistiques basées sur la comptabilité agricole", the conditions must be known in which they have been obtained and they must be compared with other statistical data. It will then be possible for these results to render real service to the science of rural economy and to farming practice, provided that on the one hand the Accountancy Offices agree to complete them by filling the lacunae noted and to adopt the same terminology, and that on the other hand the results are utilised in the true scientific spirit.

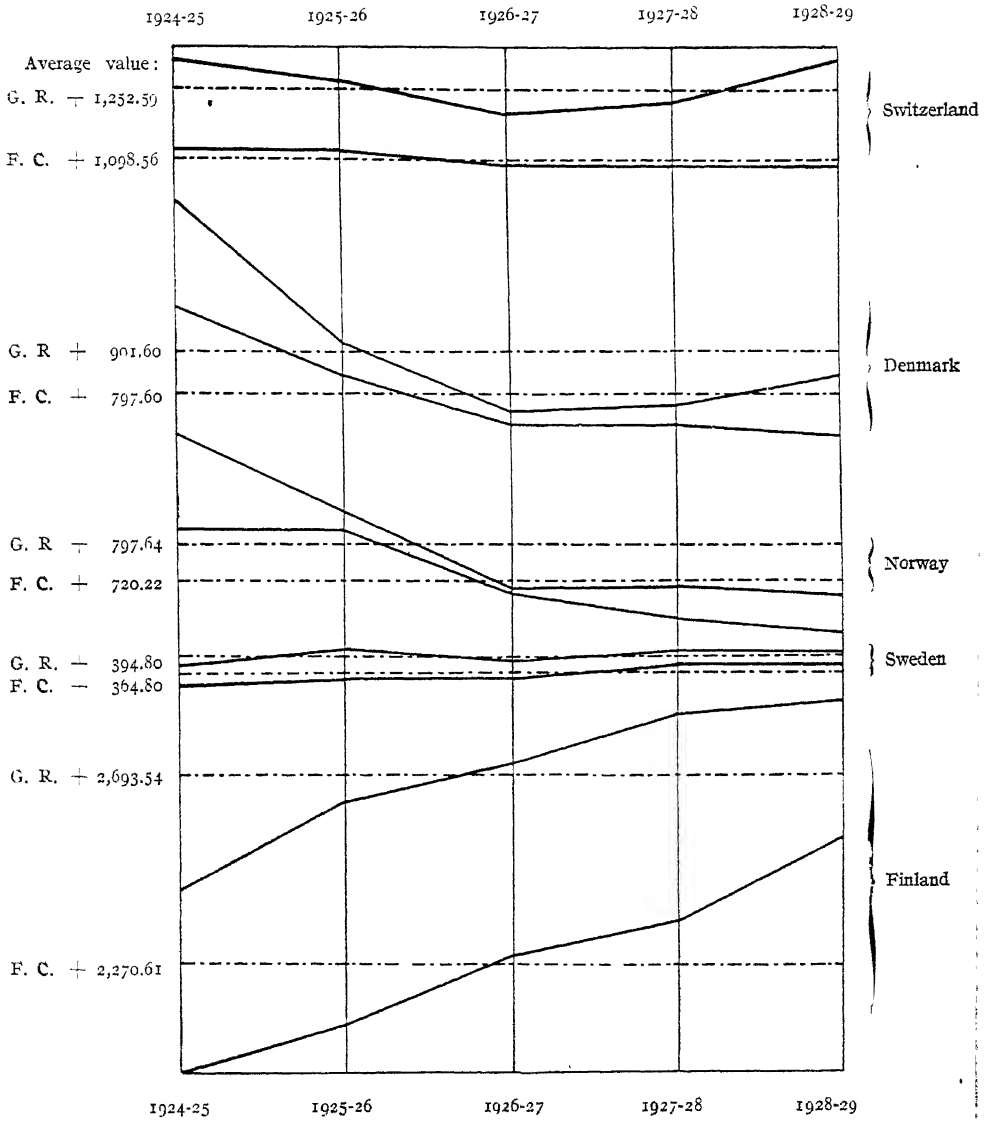
J. DESLARZES.

CORRECTION

By an error in printing in the series of tables and graphs, N. 10 and VIII are missing respectively, but the series is actually complete in both cases.

GRAPH XIII. — GROSS RETURN AND FARMING COSTS.

(Variations round the average).

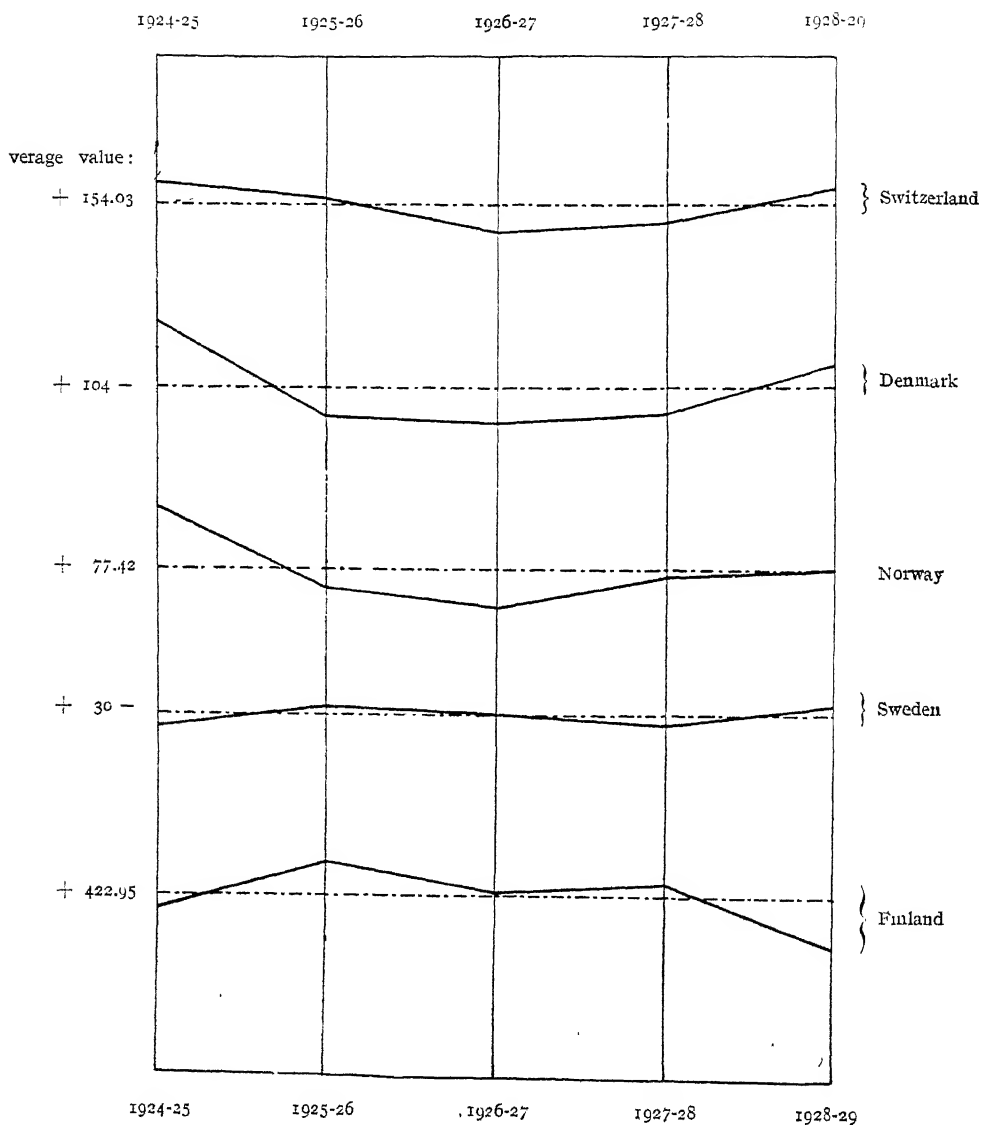


G. R. = gross return.

F. C. = farming costs.

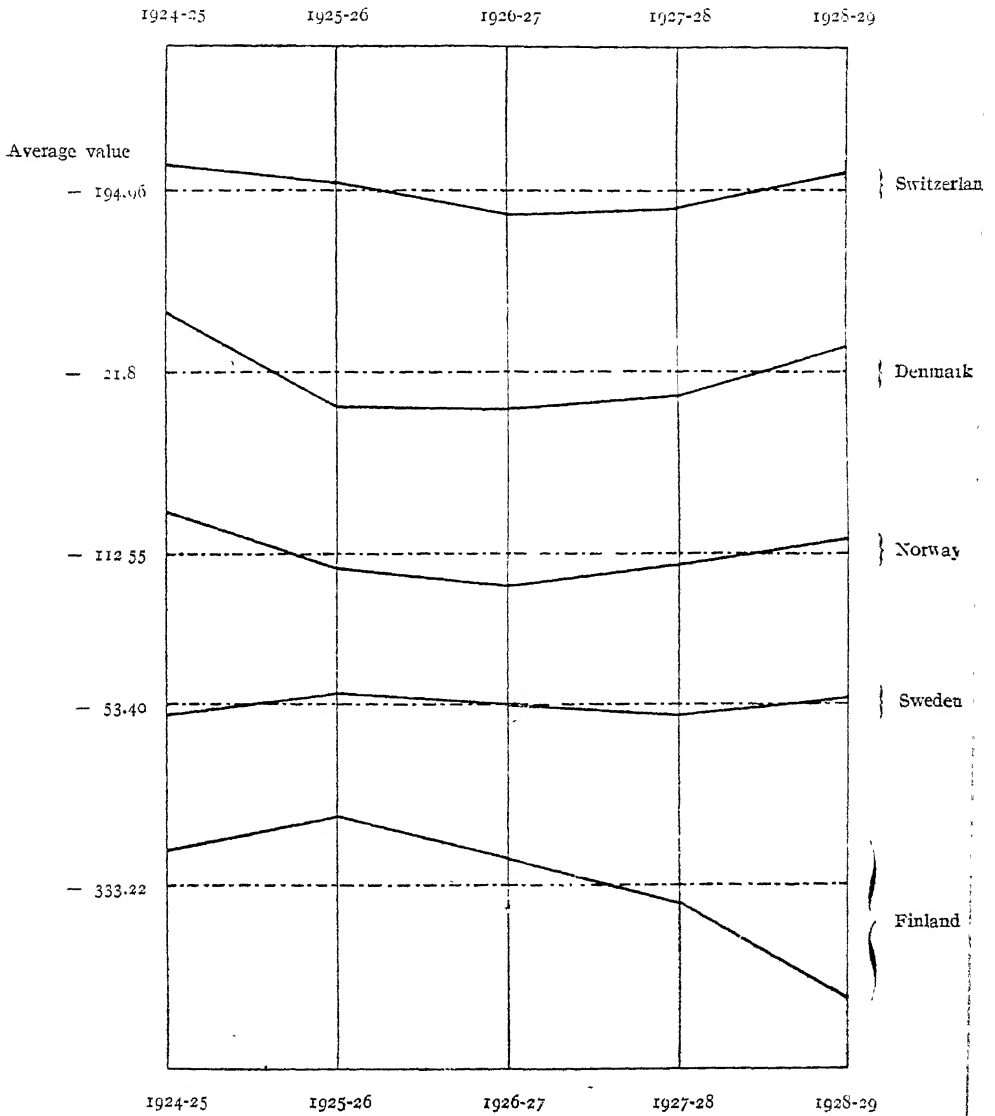
GRAPH XIV. — NET RETURN.

(Variations round the average).



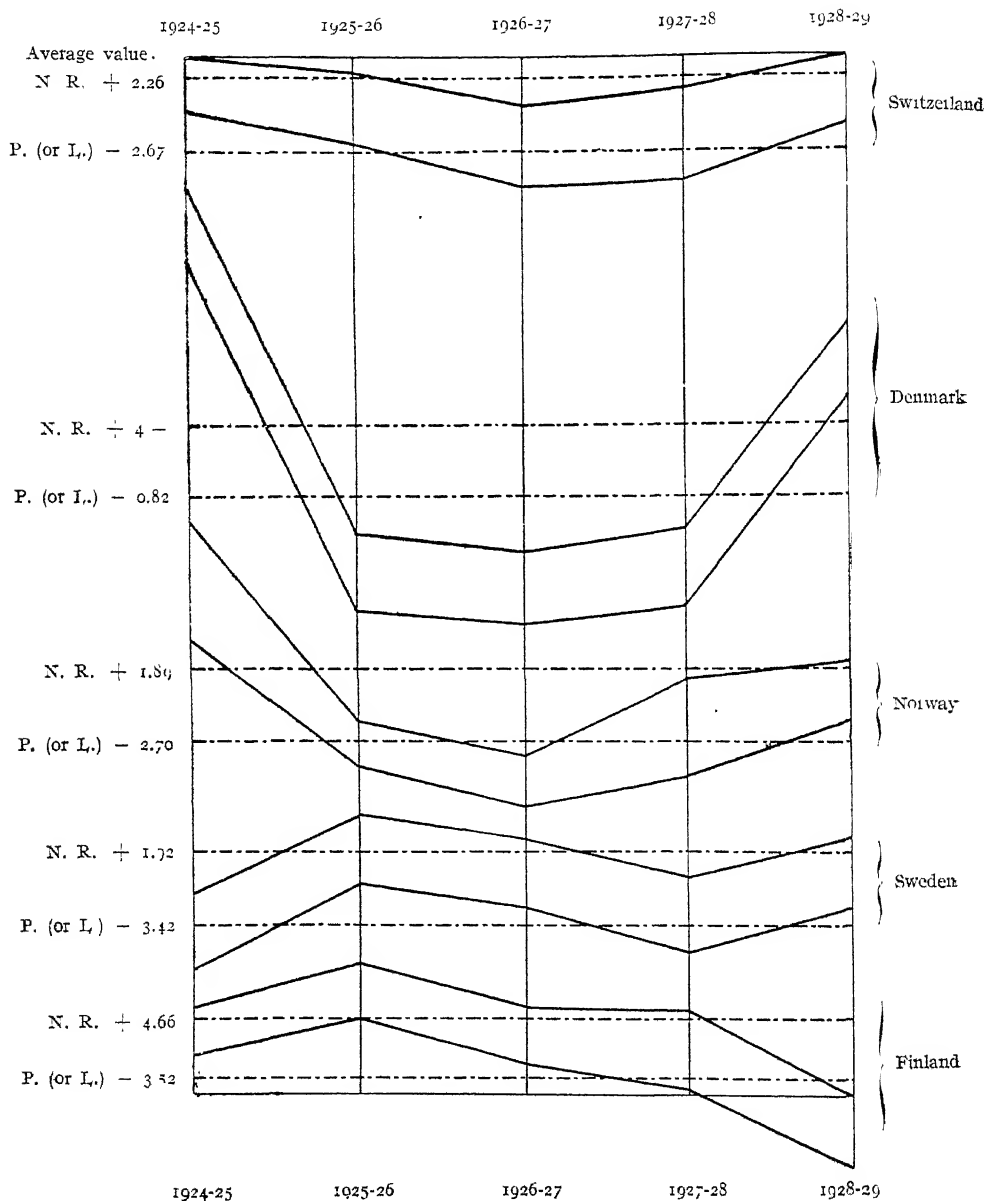
GRAPH XV. — PROFIT (OR LOSS) ON TOTAL FARMING ASSETS.

(Variations round the average).



GRAPH XVI. — NET RETURN AND PROFIT (OR LOSS) ON TOTAL FARM ASSETS IN % OF THE ASSETS.

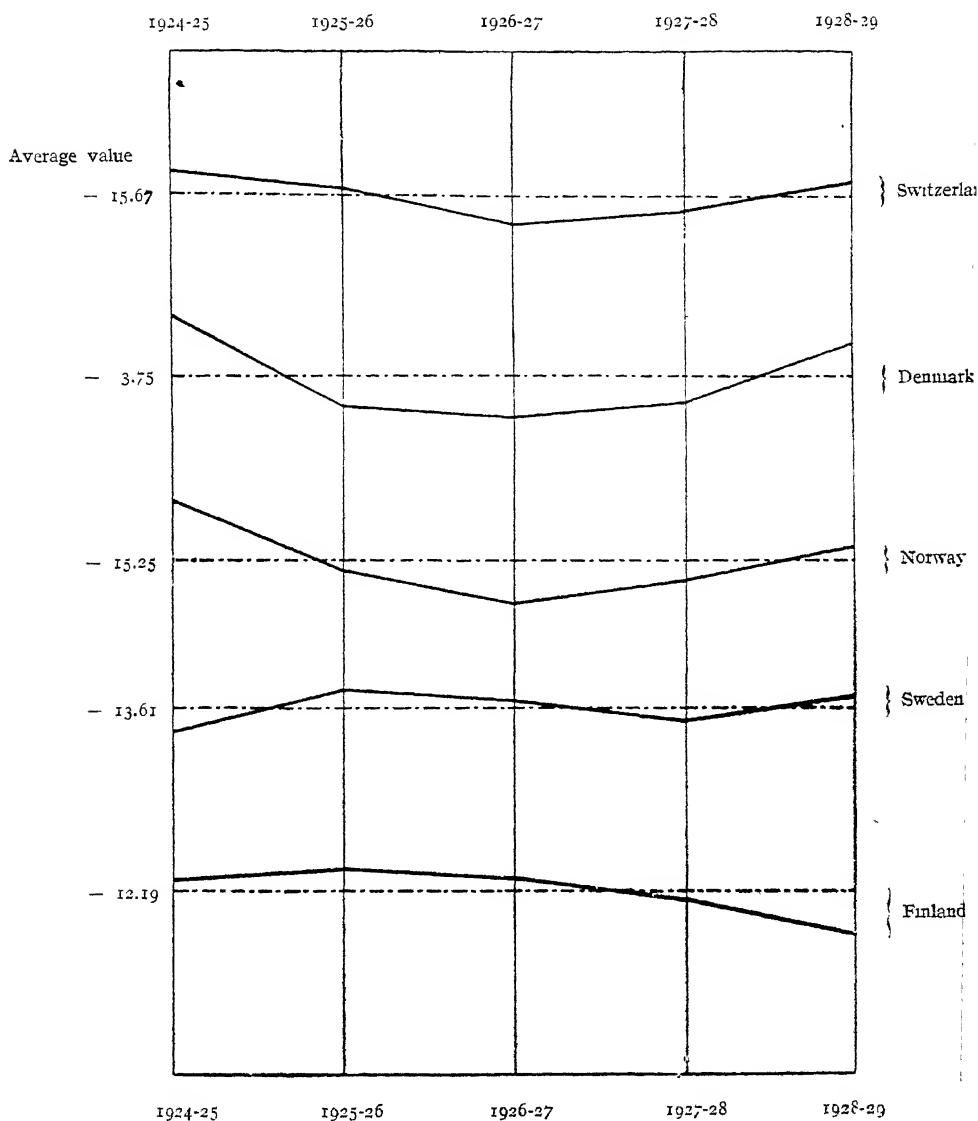
(Variations round the average).



N. R. = Net Return.

P. (or L.) = Profit or loss on total farm assets.

(Variations round the average)



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RUDOLF, Reinhard: *Weltwirtschaftliche und politische Erdkunde*. Verlagsbuchhandlung Ferdinand Hirt in Breslau, 1929, Seiten 279 (mit 212 Kartenskizzen und graphischen Darstellungen).

[Six editions of this work have appeared during the ten years that have elapsed since its first publication, *i. e.*, between 1919 and 1929, which is sufficient testimony to the success of a work executed on a large scale and giving primarily economic data and figures.

The method employed by the author, in treating of universal economic geography, differs somewhat from the traditional method. The subject matter is not arranged exclusively according to the three natural kingdoms, a division which in no way corresponds to geographic conceptions. On the other hand grouping all production according to geographic criteria is also avoided since the geographic zones often overlap, and in consequence this is not a satisfactory principle of division. The subject matter has accordingly been arranged with a view to considerations of an economic geographic character. This procedure, which is followed also by George CHISHOLM in his work "Handbook of Commercial Geography", which appeared in 1922, makes it possible for the author to set out the phenomena of world economy in a thoroughly systematic order.

The subject matter is dealt with in two parts, the first covering the following topics: Economic system of production, *viz.*, agriculture, forestry, industry, mining, etc.; the second part dealing with transport by land, water and air. The statistical data have been carefully selected. For the statistics of agricultural products, the author has consulted the Year-book of Agricultural Statistics, International Institute of Agriculture, Rome.

The author has not only studied the branches of human activity which form the object of economy, but also the human being who accomplishes the work itself, and the State, or grouping of human beings, which by means of measures of an economic or political character exercises an influence on the course of economic life. The considerations put forward by the writer are not of an abstract and logical character merely, but on the contrary are always based on the actual facts of social life.

As a work for consultation the book will be of great utility. Its value is enhanced by the fact that behind the facts and figures, in themselves somewhat arid, it is possible to discern the author's own ideal conception of what should be the social future of the world. The spirit animating the whole work best appears, perhaps, in the following sentences (p. 221) with which this brief summary may be fitly concluded: « There is no need for humanity to feel anxiety as regards its future maintenance, provided only that, by the application of a universal economy and a scientific world policy, the actually existing areas are, as the result of an equitable distribution, placed at the disposal of all nations, so that they are able to draw therefrom all the requirements of life. It is undoubtedly one of the most important tasks of our time to educate the younger generation of all countries in the light of ideals such as these. The task of a new humanity should be not the struggle of different races or groups of men for the space essential to their existence, but the utilisation in common of the economic sphere in its totality, of their own energies and of raw materials »].

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MONTHLY BULLETIN

OF

AGRICULTURAL ECONOMICS AND SOCIOLOGY

LAND SYSTEMS

Agrarian Reform in Hungary.

I. — THE POSITION BEFORE THE REFORM.

In describing the conditions of land tenure in Hungary before the agrarian reform, a distinction must be made between the pre-war and the post-war Hungary. By the Treaty of Versailles 72 per cent. of the former territory was alienated, resulting in considerable changes in the distribution of land, as appears from the following tables :

Percentage Distribution of Farms according to Size-groups in Hungary.

		Pre-war (1913) %	Post-war (1921) %
0-1	Katastraljoch (1)	21.55	20.76
1-3	»	26.84	24.96
3-5	»	14.68	13.13
5-10	»	18.28	17.78
10-50	»	16.98	20.91
50-100	»	0.96	1.36
100-200	»	0.32	0.45
200-500	»	0.23	0.35
500-1 000	»	0.10	0.18
over 1 000	»	0.06	0.12

Distribution of the Whole Area under Cultivation as between the Size-groups of Farms.

		1913 %	1921 %
0-1	Katastraljoch	1.36	0.98
1-3	»	5.80	3.89
3-5	»	6.40	4.10
5-10	»	14.27	10.33
10-50	»	34.60	32.30
50-100	»	6.91	7.25
100-200	»	4.78	5.09
200-500	»	7.67	8.94
500-1 000	»	7.16	9.45
over 1 000	»	11.05	17.67

(1) A Katastraljoch is the official unit of surface measurement employed in Hungary ; 1 kat. Joch = 0,575 hectares, 1 hectare = 1,75 kat. Joch.

As will be seen, by the loss of territory the proportion of the large estates was increased at the expense of that of the smaller. In Hungary a holding under 100 katastraljoch is reckoned as a small estate, one over 1,000 katastraljoch as a large estate. If the figures shown above are summarised from this standpoint, the following statement is the result :

Of the total area of land in pre-war Hungary (1913) the extent of the small holdings was 22.47 million katastraljoch, or 45.08 per cent., while that of the medium-sized and large estates was 26.58 katastraljoch, or 54.02 per cent.

In consequence of the loss of territory the proportion of the small holdings to the whole remaining area of Hungary fell to 44.2 per cent. Financial transactions carried out between 1913 and 1921 somewhat improved the ratio, so that at that time — immediately before the agrarian reform — the position was as follows :

	million katastraljoch	%
Small property	7.51	46.5
Medium-sized and large property	8.64	53.5
	<u>16.15</u>	<u>100</u>

As regards the ratio of cultivable land also, the alienation of territory in Hungary had unfavourable results: the proportion of the small holdings to all cultivated land, formerly 66.1 per cent., fell to 55.5 per cent. The changed conditions were also unfavourable in other respects. The proportion of the so-called tied properties (1) diminished from 31.8 per cent. to 24.4 per cent. of the total area, but the proportionate extent of the cultivable land rose from 9.7 to 12.8 per cent. The proportion of lands held in trust rose also in proportion to the total area from 4.7 to 6.8 per cent., and thus in proportion to the cultivable land from 3.2 per cent. to 4.9 per cent.

Apart from tied property, the dominant type in Hungary is land in private ownership.

Joint holding of property existed only to a limited extent, including only pasturelands or woodland. Apart from these types of joint holding the co-operative form of land owning was unknown; the co-operative tenants' societies farmed the land, not collectively but in single parcels, each member having his individual plot assigned to him.

In any case it is clear that the distribution of the land became more unfavourable in consequence of the reduction of Hungarian territory to its present extent. The cultivated area of the large estate, the extension of tied and especially of entailed property increased; and there was also an increase in the proportion of these latter types of property to the total cultivable area. It is clear from the emigration figures that there was a want of correspondence between the conditions of ownership and the social structure of the population. Between 1901 and 1913 the average number of emigrants per annum from Hungary was 120,000 the number of returned emigrants being only 22,000 per annum. Thus through emigration alone there was a loss of about 100,000 persons, out of a population of 18,000,000.

The survey of the agrarian conditions of Hungary before the reform may be

(1) Properties the transfer of which is restricted on natural or legal bounds: entailed estates, State or communal property, church lands, lands held jointly by pasturage or other societies, or as property of share companies.

completed by the data relating to the population actively engaged in agriculture. In 1920 there were :

	thousand	%
Land owners, and tenants of more than 100 kat. joch . .	80	0.4
" " " " of more than 10 and 100 kat. joch	166.8	7.1
" " " " of under 10 kat joch .	359.8	17.2
Other independent persons	24.0	1.1
Members of the farming family engaged on the farm	573.3	27.5
Farm officers, stewards, etc.	5.1	0.2
Farm servants	225.1	10.7
Farm labourers	748.7	35.9
	<hr/> 2,103.6	<hr/> 100

The agricultural population then constituted 55.2 per cent. of total population of Hungary.

II. — AGRARIAN POLICY BEFORE THE REFORM.

Agrarian policy of pre-war Hungary was distinguished by a far-reaching liberalism. Regulation of landed property including consolidation, etc., was left to the parties concerned, and the State intervened only so far as to ensure that the operations were carried out on suitable and advantageous lines. If the Ministry considered any such operation advisable, it could be ordered with the consent of one-fourth of the interested parties calculated on the basis of the extent of land possessed; in other cases the consent of one-half was required. Expenses were borne by the landowners, with the assistance of State contributions not bearing interest.

The area of entailed estates in proportion to the whole was, as has been stated, considerable. If judicial consent was given, the entail could be broken and the lands divided, or even a change in the form of tenure was possible. Entails of peasant or family farm were unknown alike to private law and in economic life; nor did inalienable family holdings (homesteads) or dwarf holdings occur. Succession of property was as a rule by the natural method of partition among the heirs, and in cases of intestacy this was enforced by law. Only exceptionally on colonies of German nationality was found the custom of inheritance by the principal heir.

In spite of the liberal agrarian policy and of the land settlement policy, which as will be seen was not carried out on any intensive scale, small property gained ground, although slowly. Its extension took place in connection with subsistence farming; the principle of small holdings was applied as a measure of relief of social and agrarian inequalities, more especially in the administration of the landed property of local authorities. Some of these authorities have even at the present day unusually extensive landed property. On the Great Plain of Hungary (Alföld) there are towns possessing property extending to 40, 50 or even 60 thousand *katas-traljoch*; in these cases it is a recognised principle that the land is to be utilised so far as possible for small holdings. Speaking generally the practice of tenancy

did not, as in many other countries, come to act as substitute for a more equal type of land distribution. According to the latest statistics of agricultural land tenure (those of 1895) 17.5 per cent. of the whole area was worked as tenant farms; dwarf holdings representing 1.46 per cent. and small holdings 9.79 per cent. In 1920 nearly 365,000 *katastraljoch* were ceded in small holdings, or 4.2 per cent. of the total area, or 22.6 per cent. of the total area held in tenancy.

The rural population have always lived and still live mainly in villages. At the same time 1,500,000 persons, representing about 715,000 actively engaged in agriculture, or one-third of the whole agricultural population, live on isolated farmsteads. From this circumstance there arises a series of economic, social and administrative problems, which up to the present have not been satisfactorily solved.

III. — MEASURES OF LAND SETTLEMENT PRIOR TO THE REFORM.

Even before the war the Government had recognised the obligation of effecting a more equitable distribution of landed property. With this object various measures were initiated which however were so framed as entirely to exclude any compulsion or any attack on free ownership.

The basic law of land settlement was promulgated in 1894. Although settlements had already been made it was this law which defined land settlement as a State obligation. By this law a fund was set aside for the operations of land settlement, consisting of three million *gulden* (nearly 6.6 million pengös) and to be supplied continuously from different sources. On the basis of this law 21 communes were settled, with 1862 farms and 165 labourers' plots, the former having an extent of from 15 to 54 *joch*, the latter from 1.5 to 5 *joch*; in all 70,000 *kat. joch* were utilised for the purpose.

In 1909 a further legislative proposal on land settlement which met the general demand for a sound agrarian policy was introduced by the Minister of Agriculture of that time, but in consequence of changes in the Government it never became law.

When war broke out and the whole population went under arms there was a general conviction that those who returned home should be assigned land as a means of ensuring their maintenance. Even while the war was going on a special type of holding, the so-called "soldier holding" (*Harditelek*) was established as being the form the grant of land would take for the soldier or the family that survived him; in addition, in order to check the encroachments of the war profiteer on agricultural land, land transfer was placed under Government control. At the same time the right of State pre-emption was defined, the object being to facilitate distribution of lands to returned soldiers.

No important contribution to the improvement of land distribution was however made by these measures, and the troops returning from the front at the end of the war found themselves, as regards conditions of land holding, up against the position as already described.

The agrarian policy of Hungary was not influenced by points of view either for or against a particular nationality. On the contrary, it was noticeable in the peace years that in Transylvania the Rumanians were acquiring lands; so that, according to the statistics, out of Hungarians every eighth, out of Slovaks every seventh, and out of Rumanians every sixth man was a landowner. Even during the war the other nationalities were acquiring land; owners of Hungarian nationality had lost by transfer 21,004 and by parcelling 90,878 *kat joch*, which meant an increase in the land held by farmers of other nationalities. If this was the case

even in pre-war Hungary, so much the less did political factors enter into the post-war schemes for agrarian reform.

The pressure of social conditions was undoubtedly very severe in the case of small cultivators who had served during the war, whether landless farm workers or owners of holdings of very small size. The first attempts at the solution of the land question show this quite plainly. Three post-war agrarian reform schemes must be distinguished in Hungary, of which one only was carried through. The intention of the popular Republic constituted under the Presidency of Count Karolyi which lasted from November 1918 to March 1919 was to recognise for the State the right of expropriation in reference to property exceeding 500 kat. joch. The Republic was however suppressed before the execution of the reform by the Dictatorship (March-July 1919), the principle of which was, instead of a distribution of land, a merging of large estates into State property and subsequent transfer to co-operative societies of farm workers for collective farming. After the overthrow of this regime in Hungary, everything was naturally reversed. These two attempts at agrarian reform proved to be quite without result.

IV. — PRINCIPLES OF THE HUNGARIAN AGRARIAN REFORM.

In the first year after the restoration of the constitution the fundamental law of the Agrarian Reform was adopted by the National Assembly. This is the law gazetted as No. XXXVI of the year 1929 which bears the name: "Law relating to the regulation of a more exact distribution of land". This was preceded by another, No. XXIX of 1920, "relating to the assignment of building sites and the formation of small tied holdings in cases of immediate urgency". The principles laid down in the fundamental law were extended by means of three new laws, in part also modified by the experiences gained during the process of getting the law passed; these are the laws I of 1922, VII of 1924 and XII of 1928. The Law XLV of the year 1921 belongs also to the same body of law which regulated the property tax on real property and Law No. XV of year 1925, which contains "orders for the facilitation of the supply of agricultural credit". Important regulations are also embodied in the Government Orders Nos. 6,000 of 1921, 6650 of 1920, 46,000 of 1920, 5500 of 1924, 5580 of 1928 and 1300 of 1929.

All these legislative ordinances are based on the following principles:

The object of the Reform is to achieve a distribution of land more in correspondence with the general welfare. The legislation encourages possession of land by those who are capable and willing to work the land with diligence and care, and who under present conditions and through no fault of their own have no part or lot in the land. Since such a distribution of land is a matter of "public interest, no one has any claim on the ground of individual right, to own land". Subordination of the individual claim to the national general interests is also strongly emphasised. These interests demand all possible safeguarding of the rights of property and of the ordering of production. Hence the aim of the reform should not be summed up as the parcelling out of the land at any cost; it should in fact bring about conditions that are in every way sounder, alike from the economic as from the social standpoint.

The wording of the law is quite clear as to what is meant by those aims of agrarian policy which are required by the public interest: "in particular the provision of land to farmers who have received decorations for valour or who have been disabled as a result of the war; the construction of dwellings for farm workers; the improvement of conditions of small holders and of owners of very small holdings

by distributing land ; assignment of land to public officials, soldiers who have gained distinction ; to stewards and other meritorious farm employees ; establishment of educational institutions and communal pastures, or finally establishment of medium-sized holdings ”.

The size of the already existing individual estates or of the parts that will be left after lands have been taken, is not limited by law. As regards the size of the farms that may be brought into existence by the agrarian reform, their superior limit is in part fixed in so far that landless persons may obtain only three kat. joch, and small holders only such an area as will complete their holding up to 15 kat. joch. Public officials or employees, as well as small manufacturers may only obtain one kat. joch, and persons of any description only an area of 600 square toises (2 yards) at most. No size limit is however established for model farms, for medium-sized holdings, for new common grazing grounds or for lands completing the area of former grazing grounds.

The tied holding is treated like any other.

Although no individual claim on the land is recognised, there is none the less a precedence established among those who are considered to be entitled to land ; certain classes merit land before others. In the first place come those who have acquired a claim to land as a result of the war : disabled men, widows, orphans, members of the Chapter of Heroes (an order founded after the war conferring on members the rank of “ heroes ”). Then come the farm workers, then the holders of dwarf or small holdings, and so the other candidates for land in their order.

In this satisfaction of land hunger of those entitled to land the property rights of other persons are as far as possible to be respected. On this account, the area of land required is in the first instance to be purchased by the State on the open market, and recourse is only to be had to expropriation if not enough land can be so obtained. Even in the case of expropriation the owner is to be fully compensated. Also on the other hand the principle of private property is preserved : the land is assigned in full ownership. Tenancies are also contemplated, but cession in full ownership is the prevailing usage.

If only as a means of subsidiary assistance, expropriation in favour of the State was made possible. In practice this was of course for the State the principal method of acquiring land, but the expropriations as a whole were not based on the title given by the agrarian reform ; a large proportion fell to the State as payment in kind of a special tax assessed once for all on the large estates. And since this tax had to be paid also on house property, property in shares, etc., large landed property was not in this respect at a disadvantage compared with other forms of capital.

It is a characteristic of this reform that in addition to creating new farm holdings it also brought new homesteads into existence in large numbers and all over the country ; that in view of the urgent requirements the solution of the financial question was postponed ; that the execution of the reform was placed in the hands of a special independent tribunal ; and finally that the object of the reform was the improvement, and the reinforcement of the small units capable of independent existence, and accordingly land could be obtained by persons who already possessed such a unit although not of the extent to have rendered scientific farming possible.

V. — THE METHODS WHEREBY THE STATE ACQUIRED THE LANDS.

There were no important areas of agricultural land in the possession of the Hungarian State ; there were of course public lands which are used as model farms or as stud farms, and accordingly did not come under the category of land for assign-

ment. In consequence such land had to be acquired from private property. No distinction exists in the orders issued between property entailed or otherwise; an exception is constituted by the estates owned by business undertakings, which are treated without further conditions as property acquired in the war, and hence a large proportion of any such estate may be expropriated. Apart from such property the tied property is much at a disadvantage since it can be bought by the State only if it does not exceed the dimensions of small or medium-sized property, which is only exceptionally the case with free private property. On the other hand under the law it becomes possible to create tied property; land may be assigned for religious or educational institutions or for hospitals, etc. The special position of owners of tied property is so far taken into account, that so much of the purchase price is payable in cash as is essential for the farming of the residue of the property remaining in their hands, while the remainder of the sum is paid in yearly instalments.

In accordance with the legislative provisions, land in private ownership may be acquired for the purposes of the reform in four different ways. One of these ways, *viz.*, that of accepting voluntary offers of land, is of relatively small importance. Persons who had distinguished themselves in the war, and had had the rank of "hero" conferred upon them, thereupon undertook the performance of certain public services, and some of them, although not all, received in return a small or medium-sized holding, to be held under a kind of entail. These so called "hero-holdings" were as a rule formed out of gifts of land made by the large land-owners.

The principal methods of acquiring land for the reform purposes are however either: 1. cession under the form of payment of income-tax, 2. purchase, 3. pre-emption by the State, or 4. amortisation.

(a) *Acquisition of Land through the medium of the Income-tax.* — As was the case in many countries, Hungary was obliged after the war to improve its financial situation by making larger claims on the private incomes of the citizens. This took the form of the income-tax which was collected on every form of capital on which assessment was possible. As regards agricultural land the amount of the tax depends on the tax on the net cadastral return. Owners of more than 1,000 kat. joch of agricultural land have to pay the assessment thus made in kind, that is to say, in land; owners of a less extent only pay in land if so ordered by the Minister of Agriculture and the Minister of Finance, or if the land required for dwelling houses cannot be acquired in any other way. Other owners liable for the tax may choose between paying by cession of land or in money. This tax, or "rançon" consists in a plot of land of value corresponding to 14 per cent. of the net return, as shown in the Land Register drawn up for the purposes of the land tax, for estates of 1,000 kat. joch; for estates of 10,000 kat. joch the tax amounts to 17 per cent. and for those exceeding 50,000 kat. joch, it amounts to the maximum of 20 per cent. The provisions did not apply to forest or vine land, in respect of which special measures were applicable.

The portions of land expropriated are to serve for purposes of land settlement; they become State property and free of all charges. Notice can be given by the State of the termination of tenancy at the end of the farming year without any compensation being due. The State is not however obliged to take over the lands immediately, it may require the owner to farm them for a period not exceeding five years at most on payment of rent at the rate usual in the locality, until other arrangements have been made. If the land ceded is not required for purposes of the land reform, the landowner may reclaim it by means of payment in cash of the tax.

In this way there was available for the purposes of the land reform a total area of 432,000 kat. joch, or about 46 per cent. of the area falling under the procedure of cession of lands as "rançon". The State has thus been freed from financial anxieties as to nearly half of the area acquired at the time of the land reform.

The assignment of these lots was carried out in the same way as that of lands acquired by means of expropriation.

(b) *Acquisition of Lands by Purchase or Pre-emption.* — In the sense of the fundamental law the State is to acquire the necessary land "as far as possible" through purchase; compulsory measures only to be employed if the land cannot be obtained where it is needed by means of purchase. A right of pre-emption is also conferred by the law on the State, separate regulations being issued in this respect.

The right of pre-emption on the part of the State is general and is inapplicable only in certain exceptional cases: *viz.*,

1. if the land is part of an area enclosed in a village or township;
2. if the buyer or the seller is some financial institution for land settlement with no private interest in the matter;
3. if buyer and seller are nearly related to each other;
4. if the buyer is a farmer or if he has had an agricultural training, is disabled as the result of the war, or is a war widow or war orphan, a soldier by profession, a public official or the widow or orphan of such official, and if the property, including all the buildings etc. belonging to the buyer, does not exceed 50 kat. joch;
5. if the property has at one time belonged to the buyer or his near relation and does not exceed 50 kat. joch;
6. if the purchase has taken place on the occasion of an allocation approved by the authorities;
7. if the purchase has taken place on the occasion of a process of expropriation and if the land is really utilised for the object mentioned in the application for expropriation.

The right of pre-emption belongs to the Minister of Agriculture. To secure pre-emption the authorities of the Land Register must submit to the Ministry every agreement for purchase, and without the consent of the Ministry no transfer of property to the purchaser can be registered. For pre-emption the conditions of the contract made by the original parties usually hold good; if however the price appears to be inequitable, it may be reduced; in this case the seller may either refuse to sell or he may leave it to a mixed tribunal to fix the purchase price. There are various provisions safeguarding transactions in land from interference arising from the right of pre-emption.

Pre-emption by the State may take place in the case of lands offered for public sale. By this method the State has entered into possession of about 22,300 kat. joch, which it has utilised for the purposes of the land reform as well as 149,000 joch obtained by parcelling.

(c) *Land acquired by means of Expropriation.* — The main innovation of the reform as compared with all the former measures of land policy consists in the right of the State, in case of need an absolute right, to expropriate land for a period of five years by legal methods and under the terms of the law on the agrarian reform. In carrying this out, the principle of full compensation is however always observed, and in addition a serial list of the properties falling under the law is established, so that full account may be taken of all equitable considerations involved.

I. — For the purposes of the agrarian reform there may be expropriated, if required, to their total extent and without regard to the size groups to which they belong the following:—

1. estates which during the period from 28 July 1914 up to the coming into force of the law changed ownership as the result of a legal transaction. There are excepted : estates to which are applicable the exceptions relating to pre-emption (1 to 7 indicated above) ; also estates unconditionally essential to the maintenance of a forest farm.

2. estates belonging to undertakings of firms obliged to submit their accounts for public inspection (share companies, etc.).

3. estates the owners of which have been convicted of offences against the State or as desertors.

These provisions applied to some 500,000 kat. joch ; of these 141,917 or 28.2 per cent. were expropriated. For the remainder the exceptions provided for by the law were applied, either because in the circumstances the expropriation of their total area was not necessary, or because the public interest did not justify such expropriation. In addition, as a rule, as much land was left to the owner as he required to continue to make full use of farm buildings and other equipment.

With the object of compensating so far as possible those persons who in consequence of the war and through no fault of their own had lost their property in land, it was ordered that property alienated by sale during the war, or a part of it, may be restored to the seller on proof being given that the sale took place through no fault of his own. If the property in question is essential for important purposes of land settlement, and cannot therefore be restored to the original seller, he shall receive some share of the material advantages which the buyer has obtained from the purchase.

If there is not a sufficiency in the locality of lands acquired by sale, preemption or as acquired during the war (see cases I. 1-3) and if there is no surplus in the neighbouring localities, recourse may be had to expropriation of lands belonging to other large owners

II. — As regards large estates, the rules to be followed for expropriation are as follows :

4. In cases where there is justification there may be expropriated even to their total extent estates which within the fifty years before 28 July 1914 changed ownership under such circumstances that the right of State pre-emption might have been exercised. In accordance with the usual practice, the more considerable part of the estate has been left to the owner.

5. On large estates of more ancient origin, it will be possible only to expropriate such part of the total extent as will enable systematic farming to be continued on the remaining part.

The Hungarian land reform — as will be clear from the following statement — is based in general, and especially as regards the large estates, on the principle of the greatest possible indulgence. The complete upheaval of the established order of the different types of holdings has never been contemplated in this reform. Any such complete change must have occasioned serious economic and social losses, and would also have led to the reversal of the social order as a whole. The object has been simply to obtain, for the advantage of the small holders, a better distribution of landed property.

The task of defining what is meant by large estates, and of fixing the size groups of estates or holdings in general, has been entrusted by the Law to a Special Court of Justice, called *Országos Földbirtokrendező Biroság* or National Tribunal for the delimitation of landed property, the duty of which is to give effect to the reform. As regards the conception of large property, in practice it has become the rule to consider as large estates property of about 1000 kat. joch, suitable for farming

purposes, and of course also those of a larger extent. The reason for the indulgence shown towards landed property is not merely the decisive importance of the principle of the inviolability of private property, but also the following considerations: The reform came about immediately on the conclusion of the catastrophe of the world war. The disturbance of production, alike by the war and by the subsequent confusion, had already been very serious, and occurred at the moment when it was more than ever necessary to increase economic capacity for production so as to remedy the destruction caused by the war, to pay off liabilities and to make possible the work of national reconstruction. Naturally the prevailing desire was that the work of reform should as little as possible interfere with the established order of production. Accordingly the Land Tribunal (*Földbirtokrendező Biroság*) is authorised to fix, in advance of any expropriation procedure, the extent to which any large estate in question could be expropriated, and subsequently the Tribunal advises the owner to sell this quantity of land by private methods for the purposes of land settlement as recognised by the Law.

III. — 6. Medium-sized and small property is not on principle expropriated. Exceptionally, however, if the absolutely necessary land cannot be procured in any other way, and if the estate is a tied one, or has changed ownership within 50 years before the beginning of the war under the circumstances already mentioned, such property may also be claimed for the purpose. The property, however, of a professional farmer, of a soldier, or an estate which has come back into the possession of a family, may be exempted.

As will be seen, the intention of the law is to take into account on the one hand the justifiability of the expropriation and on the other hand the requirements of equity and the interests of national economy. This is clear from the provisions relating to the order in which expropriations should be made, to the exceptions allowed, and to the assignment of land in replacement of that expropriation.

In carrying out any expropriation the estates belonging to the same size groups are subject to expropriation as far as possible up to the limits. Departures from this rule can only be made in quite unavoidable cases of necessity. Among the estates that should be treated in the same way there may however be some that take precedence of the others, as for example —

(a) if the owner is under guardianship and there is no heir nor any likelihood of one ;

(b) if the estate changed hands during the war or during the fifty years preceding the war ;

(c) if the owner without any cogent reasons is living in a foreign country ;

(d) if the estate is not being scientifically farmed ;

(e) if the owner has estates elsewhere and fewer children than he has estates ;

(f) if the owner, although of full age, does not farm his estate himself ;

(g) if the owner has no heir and no likelihood of one ;

(h) speaking generally : an estate acquired should be expropriated before an inherited one ; as between inherited estates, one which had been acquired by the testator before one which had been inherited by him ; and so on.

There are circumstances under which expropriation cannot take place, e. g. :

(a) in respect of those parts of the estate, which are used as gardens, hop-gardens, fruit gardens, vineyards, nurseries for trees, or which are indispensable to scientific farming ;

(b) those parts which are essential to the development of the farm and which cannot be substituted by other parts ;

(c) an estate the existence or the output of which is of service to special purposes of public utility ;

(d) land covered with reeds or willows etc., or wooded areas, sand dunes, etc. ;

(e) parts of an estate that are utilised for the purposes of agricultural industry of any kind ;

(f) the area which is indispensable for the maintenance of a dairy enterprise which has for six years at least served the public consumption requirements ;

(g) in special circumstances of that part of an estate which is essential to the organising of an independent farming unit for the heir who has received an agricultural training or for the widow of the owner ;

(h) pastures in common ownership may only be expropriated if thereby the stock farming of those entitled to use the land is not prejudiced ;

(i) the owner may state that within the last ten years before the passing of the law he has sold certain parts of his land under such circumstances as to serve purposes recognised under the law as agrarian ; in this case these particular areas are taken into account when proceeding to expropriation ;

In certain cases owners of expropriated land are compensated by assignment of other lands, as follows :

1. if small or medium-sized property is claimed for dwelling house sites ;

2. if medium-sized or small property is expropriated to its full extent, and the owner is a professional farmer, soldier, public employee, war disabled man, war widow or orphan ;

3. when at the time of the expropriation of a large estate, it has not been possible to keep to the prescribed order and to observe the rules outlined above, while there is the possibility of compensating the owner by assigning to him a plot of land in exchange, which forms part of an estate preceding his from the point of view of expropriation order.

(d) *The Expropriation Process.* — It was naturally of the greatest importance for the owners who were posted for expropriation to obtain a decision with the least possible delay. It was open to them to approach the Land Tribunal before the beginning of the process with an enquiry as to whether the State intends to exercise its right of expropriation to the full, and if for the time being not, then at what point it proposes to stop.

The Land Tribunal has the decision in all cases of expropriation. Endeavours are made during the process to settle the disputes by means of an arrangement : only in the case of failure does the matter come before the court for judgment. The process is carried out on the spot under a specially appointed magistrate.

In accordance with the law, it was the duty of this magistrate to fix the expropriation price after taking the opinion of experts. It is expressly stated in the law that the owner must receive the full value of the estate, the estimate including the value of the normal yield of the property, of the work of cultivation etc. already begun, and of the ecclesiastical charges. But in the event of failure of the parties to agree upon a price, the court might postpone, with the consent of the parties, the fixing of the value for a period not exceeding ten years, and in the large majority of cases this postponement actually took place. In such cases the court also fixed at the same time the contribution to be paid during the intervening period by the new owner either in the form of farm rent or amortisation. Industrial installations which stood on the part of the estate remaining in the hand of the owner but which could be worked after the detachment of the other part, were also expropriated by the State, if so desired by the owner.

As regards debts burdening new property resulting from expropriation, the

law distinguishes between debts secured by mortgages and others. The former remain intact and their total is deducted from the expropriation price. As regards other charges, landed property is freed from them by the fact of expropriation, and they are paid out of the total of the expropriation. Personal liabilities are also discharged by these measures; the creditor cannot demand compensation for the interest lost, except in cases in which a clause providing for such compensation has been inserted into the contract as entered in the Land Register.

Any tenancy agreements are cancelled by the expropriation, and naturally without any kind of compensation for the tenant. Naturally he is entitled to demand compensation for investments on which he has so far received no return from the farm.

Protection is also accorded by the Law to farm servants remaining on the estate which has been diminished by the expropriation. The Land Tribunal had to decide, on the basis of the extent of the estate before and after expropriation what number of farm servants are to be maintained thereon. Over a period of six years this number may be reduced only in exceptional cases where good reasons exist, and with the consent of the authorities.

By means of expropriation nearly 510,000 kat. joch were provided for the purposes of the reform. It will be seen that in spite of the endeavour to preserve the freedom of private property so far as possible, expropriation by the authorities was very necessary. Of the areas as stated above nearly 75 per cent. consisted of large estates. The medium-sized estates expropriated were mainly those that had been acquired during the war.

VI. — PERSONS TO WHOM GRANTS WERE MADE.

The principle of the Hungarian agrarian reform is that it gives no title to land. It however allows a claim, which is based partly on services rendered to the country, partly on the fact that it is expected that those benefiting by the reform will make a corresponding return by farming the land to advantage. Considerations of public utility thus weigh in pronouncing on relative claims and in this sense only can there be a question of a stronger or a weaker claim.

The serial order was established as follows:

1. War disabled men, war widows and orphans, in the event of their possessing neither house, nor land on which a house could be built, obtain in the first place a site measuring 600 *quadratelles* (3600 square metres); if they are farmers, or disabled men with a taste and capacity for farming, they also obtain a dwarf holding of corresponding size, at most 3 kat. joch; if they already own a smaller holding they can also obtain up to 3 joch;

2. farm workers may obtain a small holding of at most 3 kat. joch;

3. owners of small or very small holdings can obtain land to the extent of 15, but not more, joch by means of which their holding can be enlarged to a family holding in some relation to the conditions of the locality. The presupposition however is that they possess a private income which corresponds to the sum required for livelihood and education; in a similar manner farmers who are only tenants can obtain a small holding;

4. public employees, small craftsmen and industrial workers who are without property in land can at most obtain one kat. joch;

5. public officials or soldiers by profession who have been discharged through no fault of their own can obtain a small holding, corresponding to the amount of their final indemnity or to the capitalised value of their pension;

6. communes and farming societies may have assigned to them the land necessary for communal pastures ;

7. in neighbourhoods where small and very small holdings exist in large numbers, medium-sized holdings may be established with the intention of working them as model farms ; this however only when all the claims already indicated have been satisfied and if the person acquiring the holding has sufficient capital to invest in the land and to pay half of the equivalent value at once.

It was usually possible to satisfy applications for land made on the strength of the claims enumerated above. For land acquired by purchase or pre-emption, or for such land as was expropriated on the ground that it had changed hands during the war or within the fifty years previous, or that it belongs to an undertaker, there are still other classes of persons who may make application :

8. small farmers who had earned consideration, farmers holding agricultural diplomas, and managers or other farm employees have been able to obtain, in isolated cases, medium-sized holdings ;

9. finally, corresponding parcels of land may be assigned to parishes, higher ecclesiastical bodies, and even to institutions of economic utility, hospitals or places of instruction.

It will be seen that the number of those who were entitled to apply for an assignment of land was fairly large. The possession of capital was not made a condition ; nor was either instructional training or experience in farming absolutely essential, although in certain cases such training or experience formed a special qualification. The end in view was in every case clear : on the one hand the diminution of the agricultural proletariat by the fact that they obtained a dwelling house site, and possibly also a small holding of 3 kat. joch at most ; on the other hand the strengthening of the position of the classes already in possession of land, by enlarging their property to the proportions of a normal family holding.

The distribution of the separate groups of persons entitled to apply for land is as follows :

Soldiers distinguished for war-service	2,662	persons
Disabled ex-service men	30,024	»
War widows.	25,692	»
War orphans of full age	1,029	»
Landless farm workers	185,731	»
Holders of small or very small holdings	114,037	»
Public employees	3,771	»
Men continuing to serve in the army	2,116	»
Small craftsmen or industrial workers	40,938	»

thus in all 407,000 persons. In addition 259,640 dwelling house sites were assigned, partly to persons who had already obtained under the reform a holding of agricultural land. The number of communal grazing lands established under the reform was 923.

Leaving aside partition of property carried out for objects mainly individual

it may be said that a total area of 194,684 kat. joch have been employed solely for objects of public interest, including the common grazing grounds mentioned in the last instance.

There were of course certain conditions laid down under which persons otherwise entitled to assignment of land were disqualified.

(to be continued).

Dr. K. IHRIG.

ECONOMIC AND SOCIAL CONDITIONS OF THE AGRICULTURAL CLASSES

Discussion of Economic and Social Problems of Agriculture at the European Conference of Rural Hygiene.

The massing of human beings in large cities, more particularly in the course of the past century, has undoubtedly added to the task of the hygienists and sanitary experts, engaged in the safeguarding of the public health in cities, difficulties such as are not met with in the rural areas.

The necessity for providing hundreds of thousands and even millions of inhabitants with dwellings and with good drinking water, for the removal of vast quantities of waste material, for checking the rapid spread of infectious diseases among the dense masses of population, etc., has resulted in the concentration of attention, on the part of those responsible for public hygiene in nearly all countries, mainly on the cities and especially on the large cities. The sanitary conditions of the country have thus been overlooked, as it is usual to suppose that there life follows an easier course, owing to the influence of natural healthy surroundings and the relative sparseness of population.

In this way important differences between life in urban and in rural areas have gradually become established in many regions and in whole countries, and it is to these differences that may be ascribed the reason of important demographic phenomena, such as the higher rate of mortality in country districts as compared with the cities, and the tendency for a movement of the rural population towards the urban centres.

Accordingly for some time past, and particularly since the end of the war which brought about far-reaching economic and social changes in many countries, there has been a universal recognition of the necessity for hygienic improvements in rural areas, and finally the attention of the administrative and health authorities, as well as that of the important international organisations, has been called to the subject.

The League of Nations, accepting a proposal made by the Spanish Government, considered it advisable to summon a European Conference of Rural Hygiene. This Conference was arranged with the collaboration of the International Institute of Agriculture and the International Labour Office and was held at Geneva from 29 June to 7 July 1931, dealing with questions of medical aid for dwellers in rural areas, organisation of health services and sanitary improvement of rural districts.

As regards medical assistance to the rural population, the Conference in the first place adopted the principle that modern medicine should not be confined to the cure of diseases, but that the endeavour should always be to preserve the health by detection of disease in its latent stage, by means of periodic inspections of persons apparently in good health.

The rural populations have been too much neglected in many countries in comparison with the urban populations, but have the right to medical aid in its fullest sense. The various States are accordingly recommended to take all possible steps to provide the country districts with the necessary proportion of physicians, chemists and auxiliary staff (nurses, midwives, etc.), as well as with the funds necessary for making available for the rural population hospital treatment, clinics for diagnosis and treatment of tuberculosis, venereal diseases, etc., the services of specialists, laboratory analyses, etc.

On the basis of the statements made by experts, the Conference recommended that provision be made for a hospital for every 20 to 30 thousand inhabitants with about two beds available for every thousand inhabitants. It also recommended that as a rule there should be a practising physician for every two thousand inhabitants at most, the endeavour being to arrive at one for every 1000 inhabitants.

It was observed by the writer, during the meetings of the preparatory Commission, that such a proportion (one physician to every 1000 to 2000 inhabitants of the rural districts) may represent an ideal condition but certainly is not a condition easily reached in practice. Such a ratio may be admitted as possible when it refers to the total number of medical men in respect to the total population of a country, as in that case there are taken into consideration all specialists, surgeons, hygienists, army doctors or doctors attached to associations, etc. But when on the other hand there is taken into account the number of practising physicians who practise in the country, it would seem that if the above proportion were adopted, there would be a number of general practitioners in excess of the economic forces of the rural areas of the greater part of the European countries. In Italy, which has an excellent organisation of rural medicine owing to its long standing institution of municipal or parish doctor (*medico condotto*) the proportion is one such doctor to every 3600 inhabitants; and it is to be noted that the number of unofficial general practitioners resident in country districts and in the small country towns has not been raised in such a way as greatly to alter this proportion.

The modern physician may be said to have new and wider responsibilities as compared with the old time doctor, especially in regard to preventive medicine.

But on the other hand the work of the general practitioner of to-day is made easier by the always increasing tendency to entrust special treatments, cases of shock from wounds, etc., complicated midwifery cases, and the health services, to a specialised staff; in addition the work of the doctor is facilitated by the improved facilities in transport and communications.

If the statistics of the last 40 years in Italy are taken into account, it will be observed that, notwithstanding the plethora of medical men of which so much has been said, the number of people treated by each municipal or communal doctor has continued to increase instead of diminishing, the number having risen from 3,070 inhabitants per doctor in 1889 to 3603 in 1930. (See Report of Dr. LUTRARIO to the Conference).

As regards the means for bringing about an effective medical service in the country areas, it is recognised as necessary for the public authorities to intervene, if not for a suitable co-ordination of all the means of assistance, insurance and co-operation, then so as to fill any lacunae that may occur.

It has been estimated by experts that sickness insurance, if covering the whole of the farm workers, makes it possible for medical aid to be obtained in the country under the best conditions; but that where sickness insurance has not yet been instituted, free medical attendance, properly organised, may be of use in meeting the requirement of the rural populations.

There are here two main systems, variously applied in the different countries and different regions. The system of free medical attendance was widely applied in many countries in the past, and still is, although in a more limited degree : it is indicated as a fundamental system especially where a considerable proportion of the inhabitants are to be regarded as being without means, and it consists in ensuring medical aid and for the most part also the supply of medicines at the public expense. This system frequently gives rise to abuses in so far as it is taken advantage of by persons who are comparatively well-off.

The other system, that of sickness insurance by means of funds for the purpose and mutual insurance institutions, is more indicated when the greater part of the population is to be regarded as fairly well to do and accordingly in a position to contribute at least in a certain degree to the expenses for suitable medical aid. This is most probably the system which will in future become fundamental in many countries, and will gradually become more diffused as the economic conditions of the rural populations improve. Organisation for medical aid on the form of mutual insurance or by sickness insurance funds offers the advantage of supplying the insured persons and their families not only with treatment and medicines, but also with grants in cases of illness.

It is our opinion that the organisation based on sickness insurance should not completely exclude — at least in many countries — free medical attendance, which will always remain desirable for the absolutely destitute, in the event of serious crises of unemployment and in other circumstances. Inconveniences arising from a too radical and sudden abolition of free medical aid have been already reported from certain countries.

In the second place, the Conference dealt with the determination of the most suitable means for organising hygienic inspection in the rural districts. Absolute unanimity of views has been reached in regard to the general principle that hygienic problems must be referred to *medical officers of health*, fully responsible for the public safety, and obliged to employ all their time in the fulfilment of their duties, without any distractions from private practice. The Conference in fact recommended the *full time health officer* (to adopt the English term), regarding as inadvisable the method which consists in entrusting public health functions to practising physicians so that at one and the same time they are dealing with curative medicine and hygiene.

A further recommendation was that the health officer should be assisted in his work by an auxiliary staff, *e. g.* a nurse attendant, sanitary inspectors and also an administrative staff.

The Conference subsequently examined the programme for the health services in rural districts and concluded that it should include the following :

1. Control of infectious diseases ;
2. Control of the so-called social diseases, tuberculosis, venereal diseases, malaria, etc. ;
3. Protection of motherhood and infancy, including school hygiene ;
4. General sanitary improvement of the neighbourhood ;
5. Hygiene of milk and of foods ;
6. Instruction in hygiene ;
9. Inspection of hospital buildings ;
10. Any other duties.

The closest possible collaboration was recommended by the Conference between the public authorities on the one hand and private organisations on the other, with a view to the attainment of common ends.

Passing to the study of the suitable means for securing a good health service in rural zones, the Conference has particularly recommended that special form of health organisation in the country, known as *rural health centres*, which may be regarded as models.

The definition given of a rural health centre is as follows. It is an institution the object of which is the improvement of the health and welfare of the population of a determined region. It aims at reaching this object, either by centralising in the same building, or co-ordinating in some other manner, under the direction of the medical officer of health, the whole of the health activities of the region, as well as the organisations for social protection and welfare, so far as their functions have relation with public hygiene.

These rural health centres which have been partially developed in certain European countries, especially in Poland, Yugoslavia and Hungary, should form an integral part of the general organisation of hygiene, and are divided into two classes: *primary health centres*, in a commune, representing in the general hygienic equipment of a country the lowest stage, or the factor at lowest terms suited to the hygienic needs of the small rural communities; and the *secondary health centres*, in a district, with larger resources, and in addition with the duty of co-ordinating and completing the action of the primary centres included in the district.

The functions of the primary centres should be limited to the protection of motherhood and infancy, including school hygiene, to the health education of the population, the general sanitary improvement of the neighbourhood (within certain limits), and — in case of need — provision of first aid. The necessary staff for a primary centre would be: medical director, nurse, midwife and sanitary inspector.

The secondary centres have a much more complete programme, connected with the campaigns against tuberculosis and venereal disease, as well all the items of the general programme as set out above. There should also be available the means of diagnosis (laboratories, X rays) of hospital treatment and of special treatments. All these facilities should be available for zones with an average population of about 50,000 inhabitants with a staff consisting of doctors, nurses, midwives, sanitary engineers, sanitary inspectors, laboratory technicians, etc.

On reading the report of the special Committee, and taking into consideration the publicity which has been given to the description of the rural health centres, the impression is gained that the general spirit of the discussions was absolutely favourable to the practical and universal application of this system, in contradistinction from any other.

In reality however, both from the work of the preparatory Committee, and from the report of the reporter, the minutes of the meetings and an explicit statement contained in the report of the Conference itself, it is clear that it is not possible to recommend to all the different countries a single model of health organisation. Various delegations of important European countries have expressed themselves in this sense, pointing out that it would be impossible to abandon systems, which had already proved themselves, in favour of a new system.

The principle of *full time medical officer of health*, which forms one of the bases of health centres, is not new, and has been already for some time introduced into the sanitary legislations of different countries, such as England and Italy, in which the Health Officer is considered as a public official who must employ his whole time in the fulfilment of public health functions and not in the treatment of ordinary diseases.

If this principle of legislation has not yet had a complete application, and if

the public health functions of the Health Officer are often entrusted to doctors practising in the communes (in Italy to the *medici condotti*), this is due exclusively to economic difficulties which have prevented the complete application of the law.

Among those countries which adopt the system of health centres it is probable that development will be on somewhat similar lines. The organisation of the large secondary or district centres, will be relatively easy, as has been the organisation of good Health Offices, well equipped and well staffed, in cities and densely populated units. The institution of primary centres, on the other hand, presents economic difficulties in all the small communes, if they are to be organised with the full equipment and special staff according to the scheme as explained. The report itself allows for the possibility of entrusting the direction of the primary centres to practising physicians offering adequate guarantees from the hygienic point of view, as also it allows for the case in which there is an insufficiency of medical attendance for the sick, which may be supplied from the health centres.

In a word the rural health centres represent one of the various practicable systems for securing an effective hygienic organisation. Centres are especially recommended for countries where the need is felt for modifying or completing the public health organisation. Such a necessity is not felt in other countries which already possess traditional and sound hygienic organisations, which can be easily improved or adapted to modern requirements, provided there are no economic difficulties.

The third point with which the Conference dealt was the general improvement of the sanitation of the neighbourhood. The subjects of the discussions were for the most part the provision of drinking water, the removal of refuse, land reclamation and rural housing, and conclusions were reached mainly of a technical character, which it would be difficult to summarise in full.

Of special importance are questions of land improvements and of land reclamation. The operations of land reclamation (*bonifiche*) were in the past considered as of hygienic value only and especially in connection with the anti-malaria campaign, but at the present time when they are designed and carried out mainly with a view to agricultural improvement they may indirectly also involve considerable hygienic and sanitary advantages.

The complete transformation of the reclaimed area, the construction of new dwelling houses, the supplying of drinking water, the development of communications, the organisation of the health services and of the schools, are in fact so many factors beneficially affecting the public health and the hygiene of the country side.

In the second place, the climatic modifications, which at times follow on the sanitation and draining of the lands and on the changes in the local vegetation, may have a valuable influence on the state of salubrity, especially from the point of view of the biological action of the humidity and of the purity of the atmospheric air.

In a word, the large land reclamation works, although the fundamental purpose is agricultural may none the less bring about beneficial hygienic results, both in connection with the transformation of the soil, and by means of all the subsidiary work involved. This view was fully appreciated by the Conference of Geneva which recognised unanimously the immense hygienic importance of this nexus of operations of transformation and reclamation which in Italy — the classic land of reclamations — is now carrying out under the name of integral land improvement (*bonifica integrale*).

The subject of rural housing received no less attention at the Conference, and it was admitted that the wretched and unhygienic conditions of a very large proportion of houses in the country constitute one of the most important methods of ex-

plaining certain demographic phenomena, such as the higher rural rate of mortality, the tendency to the rural exodus, etc.

The Conference has discussed the problem of rural housing especially from the technical point of view. The intention was to establish all the details essential to arriving at sound and healthy buildings, and to avoid many of the defects which very frequently bring about the unhygienic condition of the old houses of the countryside.

Taking the discussions as a whole together with the report that was approved, the impression gained is that considerable progress has been made in the technique of rural buildings from the special point of view of health conditions and that a large number of special problems may be said to be in course of solution: but that on the other hand, other problems, and primarily those of the removal of filth, of fertilising materials, of the campaign against winged insects, etc., still require further attention.

The explicit recognition of the necessity of a more thorough study was the immediate cause of the resolution passed by the Conference that the question of rural housing should be further examined. The bodies concerned in this matter are the International Institute of Agriculture and the International Labour Office.

For the solution of the questions inherent in the general sanitary improvement of the neighbourhood, the very important and fundamental technical studies constitute only one part of the various aspects of the subject and are subordinate to the economic and political factor.

Land reclamation schemes on a large scale, such as extensive reforms in rural housing, belong in fact to that category of hygienic operations for which it is not enough to use the arts of persuasion, of propaganda or organisation. Such schemes require large funds for execution which are not or only partially at the disposal of private initiative, and can only be ensured by the intervention of the public authorities, either directed towards the co-ordination of private resources, or still more effectively with the grant of loans or of funds repayment of which is not expected.

Primary importance accordingly attaches to legislation, and there is no country which fails to appreciate its value. For this reason, the International Institute of Agriculture considered it advisable to co-operate in the preparatory documentation of the Conference, by means of the publication of two monographs, one reviewing the ancient and modern legislation of all the European countries on the subject of land reclamation and land improvements, and the other passing in review all political and economic action taken for rural housing in the different countries of Europe.

The wide scope and importance of the programme examined by the Conference will be clear from this brief summary. All that was contemplated, however, was the formulation of recommendations, without arriving at any binding conclusions. It is to be hoped that this first international meeting will be the beginning of an extensive hygienic movement, of which every country is feeling the need if the welfare of the too long neglected rural population is to be ensured.

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MARKETING OF AGRICULTURAL PRODUCE

The South African Advisory Wool Council.

Owing to the general fall in wool prices the position of the South African wool growing industry was in 1929 already causing considerable anxiety. A representative meeting of woolgrowers met in Bloemfontein in September 1929, and forwarded

a request to the Government for the institution of an export levy on wool for the benefit of the industry. Accordingly a levy of 1s. per bale, with inspection at the ports, was instituted as from 1 January 1930, the proceeds to be devoted to the advancement of the industry, research work, organisation of growers, propaganda, etc. As a natural outcome of this move and also on the express proposal of the Bloemfontein meeting, an Advisory Wool Council was soon after appointed, with the duty of advising on the application of the fund raised by the levy, and in general on the problems of the wool industry. This Council consists of the Secretary for Agriculture as Chairman; the president of the National Woolgrowers' Association, representatives of the Agricultural Unions of the four provinces, and two members representing the unorganised woolgrowers of the Union, while an official of the Department of Agriculture was to act as Secretary.

The first meeting of the Wool Council was held in April 1930; since then committees of the body have dealt with the questions of organisation of growers and of improvement of marketing conditions. As regards the former, the Committee was in favour of re-organisation of the National Woolgrowers' Association as a central body enrolling all woolgrowers but not entailing special obligations, and recommendations in this sense were subsequently adopted at the National Wool Conference held at Bloemfontein on 28 August 1930. The report of the Committee on marketing dealt with the following points: the importance of thorough grading and classing of wools; the necessity for support of the public auction sales by growers; extension of the wool-selling season over a longer period, with arrangements to prevent overlapping of the sales held at the four port markets of the Union. It will be observed that these recommendations were in fact in line with the similar measures either long practised or recently adopted in Australia, and are precisely the measures advocated at the International Wool Conference at Liege on 10 and 11 September 1930. It proved however not possible to press these proposals, in their entirety and at once, upon the new organisation of the industry in South Africa.

Among the activities of the Wool Council have been the establishment of a Wool Information Bureau, and the prosecution of enquiries on the overseas markets and in Australia. In this latter country economic enquiry and investigation as between wool-growing countries have already been initiated, and the possibility of co-operation in regard to sales, with the view of avoiding any large world carry-over, is being contemplated. All these ideals have since the institution of the Wool Council received a very considerable impetus from the discussions and recommendations of the Empire Wool Conference held in Melbourne in June 1931.

During the first two months of 1931, the Wool Council also carried on a rationing scheme, the object of which was to prevent flooding of the four port markets. Certain objections were however raised in March by the South Africa Brokers' Association to its continuance, except in times of emergency. It was agreed between the Council and the Association that the general question of rationing should be further and more thoroughly explored by both the Council and the trade, especially in the light of conditions obtaining in Australia, and of any recommendations that might be made by the Empire Wool Conference.

The initiation of the Wool Council has undoubtedly done much already to benefit the South African wool trade, largely as result of the attitude of collaboration adopted by the Government towards the growers, and because from the first the advantages were realised of the interchange of views with Australia. This desire to profit by the experience and superior organisation of the industry in Aus-

tralia is embodied in the proposal made at the Empire Wool Conference for the regular supply to the Wool Council of cabled information in regard to the course of Australian markets in detail.

C. H.

The British Empire Wool Conference of 1931 in Melbourne.

The recent crisis in the wool industry showed plainly the need for consultation in regard to the common interests of the wool growing countries. Nearly half the world supply of wool is grown in the British Dominions, about one-quarter of the whole being produced in Australia, about one-sixth in South Africa and New Zealand taken together, while actually 3 per cent. of the world supply is grown in Great Britain. The Conference which took place in Melbourne on 22 to 24 June 1931, was attended by representatives of the woolgrowers of South Africa, New Zealand and the States of Australia, by representatives of woolbrokers of South Africa, New Zealand, England and the States of Australia, by leading wool financiers of Australia, and by a special delegate, Sir John HIGGINS.

A Committee, representing all the interests concerned, of which the chairman was the leader of the South African delegation and Secretary of Agriculture for the Union of South Africa, submitted recommendations relating to the agenda. The report gave rise to a number of resolutions which may be summarised as follows:

Marketing of Wool :—

(a) that the best method of selling wool is by means of public auctions ;
 (b) that the present fall in prices is not due to over-production ;
 (c) that the Conference while urging co-operation in marketing between the countries represented, so as to dispose of the respective wool clips to the best advantage of the grower, is agreed that the adoption of any scheme which has as its basis an arbitrary fixation of prices would not be in the best interests of the wool-growing industry ;

(d) that with a view to stabilising the wool market the following two measures be adopted : 1. regulation of the woollselling season in order to permit of suitable offerings while avoiding a carry-over of wool into the next selling season ; 2. co-operation between the various parts of the British Dominions in the offering of future wool clips ;

(e) finally, that the Conference is opposed to any scheme for marketing of wool that ignores the law of supply and demand.

All the above resolutions were carried unanimously, with the exception of the first to which were there two dissentients, both representatives of the South African woolbrokers.

Resolutions were also passed relating to the necessity for great care in the classing and preparing of wool for sale ; the desirability of early publication of estimates of each season's wool clips, with separate estimates for Merino and cross-bred wools ; the standardising and marking of woolpacks ; the effect of futures markets on producers' interests ; the advantage of publication of wool prices realised at sales.

The Report of the Wool Markets Committee dealing with details of marketing was also carried, including recommendations for the weekly publication of the average price per pound and per bale of wool in grease for Australia, with the previous week's average, and the average for the season to date of report. As regards quotation of top prices it was recommended that brokers should state the number of bales in any lot commanding such prices. An important section of this Report dealt with the supply of information by cable from the Australian Wool

Growers Council to the South African Wool Council, recently formed, such information to be at the cost of the South African Council and to include the following items : programme of sales and allocations to markets in Australia ; estimates of clip ; Australian exports ; weekly report ; of (a) quantities offered and sold at Sydney, Brisbane, and Commonwealth ; (b) classes of wool offered ; (c) demand from each country ; weekly reports, on the basis of scoured wool prices, for certain qualities of wool ; average price realised per pound and per bale for previous week in Sydney and Brisbane markets.

A report was also made by the Agenda Committee on certain schemes submitted for consideration. Of the four schemes, three were not recommended for discussion as being based upon or involving the principle of price fixing, which the Conference had already agreed not to be in the best interests of the woolgrowing industry. The fourth brought forward by Sir John HIGGINS is based upon the principle of insurance against loss through falling prices, and the Committee recommended to the Conference that it be referred for investigation by independent competent authority.

The scheme for the equalisation or insurance of wool values submitted by Sir John HIGGINS may be briefly summarised as follows :

The proposal is to found an association in order to assure to woolgrowers an average annual price over cycles of years for each type of wool produced. In other words the object as to stabilise the value, or " insure " the price on a flat rate basis over Australian wool clips for cycles of 10 years, the wool to be insured on the basis of 8*d.* per lb. of wool in grease for the whole Australian clip.

The wool is to be appraised on the basis of 8*d.* per lb. of greasy wool, and an advance made on that basis fourteen days after appraisalment. Adjustments, if any, on actual returns are to be made at the close of each wool year or season when the wool has been sold. An allocation is to be made of the surplus returns, if any, over 8*d.* per lb. somewhat on the following basis : 82.5 per cent. to wool suppliers ; 10 per cent. towards the building up of capital for the association ; 5 per cent. stabilisation or insurance premium, with a view to the establishment of a fund to meet the annual premium ; 2.5 per cent. towards a research fund, for experimental investigation and general betterment of the wool industry.

When a capital of, say, 10 millions sterling has accumulated, the deduction of 10 per cent. for the building up of capital can be eliminated or reduced. A similar policy may be observed as regards the stabilisation or insurance premium fund. On the other hand the percentage of surplus payment to the wool growers or suppliers may be correspondingly increased. Bonds may be issued with a low rate of interest, such bonds representing the growers' or suppliers' interests, if any, in such capital and insurance funds.

The above will form the Australian unit in the " Empire Wool Scheme ", other countries coming in on a similar basis, and co-operation and co-ordination of all the units will be arranged on all matters relating to the realisation or marketing of wool.

Figures were also supplied showing that over the last three ten-years cycles, the total of differences in years where values have been at *more* than the basic price of 8*d.* per lb. amounted to £334,710,000, while the total of differences in years where values have been at *less* than 8*d.* per lb. is £4,065,000. Taking the weight of all the Australian clips over 30 years, *i. e.*, 17,686,907,000 lbs., the cost of the deficit per lb. of wool in the 6 years out of 30 when values have been less than the basic

price of 8*d.* amounts to $\frac{£\ 4,065,000}{17,686,907,000} = .05516$ pence.

Hence to allow for expenses, etc., which may be calculated at 40 per cent., the premiums per lb. of wool would not need to be more than, say, .09 or about one tenth of a penny.

Now one-tenth of a penny on 17,686,907,000 lbs. = £7,369,545 which after deduction of 40 per cent. for expenses etc. leaves £4,421,727.

As the claims would amount, as above, to £4,065,000 for six years out of thirty years, or three cycles, there would be a surplus of £356,727, which could be distributed in accordance with the scheme proposed.

Other resolutions urging that each of the Dominions concerned should be responsible for carrying out research work, both scientific and economic, in connection with the wool industry, stressing the importance of such research, and advocating a similar policy in respect to wool publicity, were carried.

The leaders of the respective delegations undertook to lay the resolutions of the Conference before the woolgrowers of the different countries with a view to securing acceptance of the principles involved, and to formulating a scheme for giving effect to them, the results to be communicated as soon as possible to the Chairman of the Conference.

In addition the Conference appointed a representative Committee, under the chairmanship of the Chairman of the Conference, to confer with the representatives of Argentina and Uruguay. As regards Argentina, immediately on the closing of the Conference, this committee was able to confer with the representative of the Argentine Government in Australia on the question of establishing closer co-operation between the Dominions and Argentina in all matters relating to the wool industry, and suggestions for co-operation were cordially received.

It will be seen that although it is too early to say how far the wool industry will benefit from the deliberations and decisions of the Conference, a solid foundation for future co-operation has been laid. There was abundant evidence that the interchange of views and experiences which has gone on, especially between South Africa and Australia, during the course of the recent wool crisis, has been fruitful in establishing a common basis of opinion in regard to the major questions in debate on which as has been seen there was practical unanimity.

C. H.

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[In connection with the world sugar convention signed in May 1931 at Brussels covering 60 per cent. of the world sugar production and 80 per cent. of the world sugar exports, and with reference to the fact that the Five Year Plan makes provision for a much accelerated development of the Russian sugar industry, the study of the problem of sugar beet industry in the U.S.S.R. gains a quite special significance. According to the Five Year Plan over 30 million tons of sugar beets should be harvested in Russia in 1933, as compared with about 10 million in the years 1909-1913, and it will be possible to manufacture approximately four and a half million tons of sugar from the crop, as compared with one and a half million tons in the years 1909-1913. The sugar industry is to be in this way so established as to take the first place in the world. This immense development will have but little influence on the world market price of sugar, since the Russian manufacture is intended with a few unimportant exceptions for the home market which is capable of great expansion and is still far from having reached saturation point. The average annual consumption per head for sugar in the last pre-war years was in Russia 18 lbs. in France 41, in Germany 48, in England 96 and in Australia 180, in

consequence of the great expansion of popular tea-shops the consumption of sugar in Russia is now much higher

The writer, who deals with the statistical data with great circumspection and critical power, draws a picture of the Russian sugar industry in its place in the whole Russian national economy. At the beginning of the war the sugar industry was expanding very considerably. Then, in consequence of the maladjustment between the prices for grain and potatoes on the one hand and those of sugar beet on the other, a long but steady shrinkage took place, which lasted till the year 1922. Since that time there are considerable after effects to be noted, both as regards the expansion of the area of cultivation of sugar beet, as well as in the yield in sugar. The pre-war figures are already exceeded by a great deal.

It is for the moment difficult to investigate the question of earning capacity of the sugar industry or of the costs of production, because the fundamental facts are not available. According to the writer the costs of production have fallen during the last few years: from 25 roubles per quintal in 1924-25 to 19.62 roubles in 1927-28. These costs are however still much above pre-war costs: 12 roubles per quintal in 1913-14.

The writer is sceptical as to the attainment of the anticipated great development of the sugar industry under the Five Year Plan and is doubtful of the possibility of realising in the short span of five years such a project of a magnitude so far unprecedented, unless by modification in many respects of the general agrarian policy. He is however of the opinion that great moral importance attaches to the promulgation of the Five Year Plan, as providing a stimulus to the activity of the country side and bringing it closer to the economic ideal]

DOKLÁDAL JAN, dr. : Racionalisace zemědělské výroby v ČSR (Rationalisation of agricultural production in Czechoslovakia), Prague, 1930, Minister of Agriculture, 521 pages, 22 diagrams.

[The urgent character of the problem of rationalisation in agriculture is making itself equally felt in Czechoslovakia as elsewhere. In this country, 85 per cent. of the cultivated land consists in small family farms under the management of persons of very varying capacities and professional training. It is for this reason that the methods to be followed in view of the required end must be so chosen as to be applicable in each region — determined by the same general conditions, economic, natural, social — to the whole mass of the medium-sized and small farms, regarding such an agglomeration as a kind of economic unit.

The writer's first care is to establish precisely the typical phenomena and the errors in technique and in management that are found to be prevalent on these farms. For this purpose, he has made use of two methods: 1. enquiry by means of a written questionnaire consisting of 18 questions addressed to 671 persons of education, mainly themselves farmers who are well acquainted with the conditions of agriculture in their own region; 2. utilisation of existing statistical material referring to the position in regard to the essential means of production in agriculture.

The information thus collected has been classed by districts, and by the natural economic regions; it was then checked, collated and analysed, so that it is possible to draw important conclusions for the establishment of a programme of rationalisation. The results of this analysis have shown that the typical errors exist sometimes singly and sometimes in combination, and also vary in character, according to the regions and according to the different size-groups of farms.

The majority of the errors are mutually interdependent in such a way as to form a combination or nexus which can be traced to one original cause. If this cause can be removed it will be possible also to eliminate the majority of the errors and to remedy the defective economy of the whole mass of the farms. With a view to distinguishing between these combinations of errors, an analysis has been made taking into account the following points of view: 1. errors of organisation originating in methods of farm management adopted, methods requiring a long period for their full effect, and reacting on the periodic production processes; 2. errors of the farming season in course; 3. errors arising out of the close connection of the family of the farmer with the farm; 4. errors in the commercial working of the farm.

A study has also been made of the influence of the different degrees of rationalisation on production and on profit capacity, observations being made over two years of a number of peasant holdings under similar economic, natural and social conditions, employing both the method of book-keeping by double entry and also that of making personal enquiries. It has been shown in this way, for example, that taking the net return per hect-

are of the farm with the low degree of rationalisation at 100, the net yield of the farm with the higher degree was 218.

The errors indicated in the different regions have proved the starting point for the views of those who took part in the enquiry relating to improvement of the economy of the small family farms. Local circumstances were consequently taken into account in forming opinion. The errors were classified according to districts and regions, natural and economic, and were analysed in accordance with differing criteria. The result has been that the proposals made for removing the causes of error display a striking unanimity. It is interesting to note that the greater number of the proposals are in favour of legal measures, and in particular urge compulsory attendance at schools of agriculture, legislation providing for the compulsory formation of farmers' vocational associations (Chambers of Agriculture), the compulsory installation of certain types of equipment on the farms, for instance, suitable manure stores, etc. From all the information received it is clear that agricultural progress, as well as the propaganda work in its favour, must be adapted to the present condition of production and to the mentality of the cultivator. The farming programmes suggested must be based not only on purely scientific knowledge, but on practical experiment. The methods of rationalisation established up to the present cannot always be put into practice on the mass of peasant farm holdings. Although agricultural education is well developed in Czechoslovakia, only one fifth of the farmers attend the schools of agriculture. It thus becomes essential to supply to the family farms as a whole certain general information on production and on the means of production, in such a form that it can be applied in each farm. Workers in the scientific and vocational sphere of agriculture will thus find themselves confronted with a new task, *viz*, that of establishing: 1. a programme relating to the measures the nature of which depends on unforeseen influences and which in consequence have to be modified to suit the circumstances, among such measures are, for instance, methods of tillage and of cropping; 2. regulations in respect of the employment of requisites the efficacy of which extends only to a single process of production, as, for example, chemical fertilisers, concentrated stock feeds, such rules to be established alike in respect of the kinds to be employed and the quantities; 3. models, either in regard to the most suitable resources of production, such as: the different crop plants, the composition of grasses for sowing of meadows and pastures, breeds of live stock, etc.; or to the means of production intended for use over a period of years, such as farm buildings, farm machines, etc.

It is not a question here of the so-called prescriptions of which one feels a well-grounded distrust, but rather of a systematic direction of the economy of the mass of peasant farms, a direction which would be based on the scientific knowledge, practical experience and the systematic investigations carried out by the scientific and vocational institutions. In this way the realisation on the peasant farms of the principles of rationalisation will be reached more easily and quickly than could be done by following the methods employed heretofore which consisted mainly in prolonged studies of the factors of production. There must be a modification of the principles and methods of the rural economy which must henceforth be more closely adapted than they have so far been to the needs and the character of small and medium-sized farms, taking into account the structure of the farming units and the conditions of the social factor represented by the farming family. Economic methods and technical knowledge have only a relative value, since conditions change as time goes on. Close contact must be maintained with agricultural practice, and all policies directed towards a definite aim must be thought out and organised according to a well defined plan. It will be necessary to organise systematic collaboration among all the institutions which work for and endeavour to diffuse agricultural progress. Local organisations will also have to be set up, which will keep in touch alike with scientific institutions and with practical conditions and which will, in dependence on a supreme central body, be called upon to carry out the policies indicated. In Czechoslovakia, this function might be entrusted to the agricultural schools, which even at present do somewhat similar work, although so far in a less systematic way. These schools must be founded wherever they are needed, so that each district with some thousands of farms (from three to five thousand) would have a local organisation intended not merely for the purpose of fulfilling the functions of school instruction properly so-called, but also designed to become a practical school of economic progress for all the farmers of the respective districts.

The publication contains several tables, diagrams, replies of those taking part in the enquiry, schedules and a scheme of practical activity for the local centres].

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OF

AGRICULTURAL ECONOMICS AND SOCIOLOGY

LAND SYSTEMS

Agrarian Reform in Hungary (Part II).

VII. — SMALL TENANCIES AND PERPETUAL LEASES (OR OWNERSHIP ON PAYMENT OF RENT INSTALMENTS).

The Hungarian agrarian reform would have been incomplete, if the State had not made provision for the possibility of extending also to the question of tenancies the validity of the principles underlying more equitable distribution of land. An increase in the number of small tenant holdings would have had the advantage of being the course involving the least difficulty from the financial standpoint. The chief desire was however to create as many peasant owners as possible, since it was on ownership of land that the landless and land hungry sections of the population had fixed their hopes. Hence tenancies became of minor importance in the reform ; in all 157,586 kat. joch were assigned to small tenant farmers, or one seventh part of what was distributed in full ownership.

Ownership on payment of rent instalments was introduced with the object of bridging over the financial difficulties ; this new form of ownership was however little utilised.

The regulations respecting the State right of pre-emption were similarly applied to tenancies. Before the property actually passes into the hands of the tenant the letting agreement must be submitted to the competent authority who must then decide within 30 days whether the State will or will not enter, in place of the tenant, into the agreement on the same conditions. If however the tenant is an agriculturist, or if there are no pressing reasons for the establishment of small tenancies, the agreement cannot be taken over by the State. The State may also become directly or indirectly one of the parties to the contract, but if not, it has the power to compel the tenant to assign directly to small tenants 15 per cent. of the area included under his lease. This is one of the methods by which the necessary land for the establishment of small tenancies is acquired. The following is another method : the owner, whose land is rented, may be obliged, in place of pre-emption or expropriation, to hand over a certain part of the property to small tenants, and on reasonable terms. The third method is that, in the case of tied or inalienable lands, the State may postpone expropriation, and may instead ordain that an equivalent portion of the estate be handed over to small tenants, on conditions determined by the State ; in the event of such estate not being properly farmed, it may be acquired in its entirety in this way.

The necessary safeguards were also provided in reference to the small tenant holdings already in existence at the time of the reform. If the estate, which is liable to expropriation, is rented by small tenants, the process of expropriation may be postponed and the State then comes in as tenant in chief between tenant and

owner. If those persons, who have become small tenants by the method described on land of a tied or inalienable estate, have been, at the time when the expropriation process in relation to the property is initiated, already in possession of their holding for five years, they enter a claim for the piece of land in question to be transferred to them either in return for purchase money or as ownership on payment of rent instalments.

Apart from the cases mentioned there are three more, in which ownership on payment of rent instalments can be acquired :

1. on expropriation of lands, which were acquired in the war, or the owner of which was sentenced for offences against the State ;

2. on the occasion of other expropriations if the former owner gives his consent or if the State is in a position to pay over to him the capital representing the yearly payment ;

3. the State may also establish ownership on payment of instalments out of the land acquired by way of income tax payments.

In any case this form of tenure can be applied to small holdings, and to medium sized holdings only in the case of model farming or communal grazing, or if the holding is set aside for purposes of public utility.

VIII. — ASSIGNMENT FOR DWELLING HOUSE SITES.

As regards this part of the whole reform, its urgency and equity was recognised on all sides. Its legal regulation and execution took precedence of the agrarian reform proper.

Special recognition was made of the claim of disabled ex-service men, war widows and orphans to dwelling house sites, without regard to whether they were farmers or not. If however such persons are farmers, they obtain in addition, as has been stated, also agricultural land. Similarly the public employee dismissed for no fault of his own, or the soldier by profession, properly has a claim to a dwelling house site. Speaking generally, all persons who came under consideration for a grant of agricultural land were also entitled to a building site.

In all 58,584 kat. joch were distributed for 259,640 dwelling house sites.

It was a more difficult problem how the people concerned were to build their houses. For assistance in this respect, an organisation was set up by the State in the form of a co-operative association, which provided credit, and in particular advanced building material.

IX. — THE NATIONAL TRIBUNAL FOR THE REGULATION OF PROPERTY IN LAND.

It was a primary maxim with those who were responsible for the reform that economic disturbances could only be avoided and fair dealing be expected on both sides, if the law provides not merely mechanical prescriptions but rather a framework within which regard may be had in the course of execution to the requirements of life as a whole. On this account the execution should be placed in the hands of those who provide the guarantee that they are entirely free from all other influence and are guided only by the public interest or common weal which it is the object of the law to safeguard. On this account there is a special tribunal for the execution of the reform, the composition of which guarantees its independence of the parties interested, and of the Government and the political party in power at the time.

The two highest tribunals in the country (the court dealing with civil law and that dealing with administrative law) appoint each nine magistrates to this Land Tribunal, ten members are appointed from among the members of the National

Chamber of Agriculture; four members are delegated by the Minister for Agriculture, one member each by the Ministers for Internal Affairs, Justice, War and Education; finally one member by the two co-operative land mortgage credit institutions and one by the National Central Credit Association. Only the president, the vice-president and the three advisory presidents are appointed for life on the proposal of the Government. Of the other members six retire each year. The Tribunal functions in separate courts, or Senates, which consist of three judicial members, one farmer member, one delegate of the Ministry of Agriculture and one member of another group. In certain cases the Council of the Presidency of the Tribunal has the power of a court of appeal; apart from this the Tribunal, or its Senate, makes final decisions. In the composition of the separate Courts, or Senates, special care is taken that there shall be always sufficient members with judicial qualifications.

X. — OTHER AGRARIAN MEASURES.

It was a natural extension of the reform to take steps to ensure that on the one hand the land assigned remained with those who had obtained it, and on the other hand that private transactions in land should be conducted as much as possible on lines in harmony with the agrarian policy contemplated by the law.

Land assigned under the reform cannot be alienated within ten years without consent of the Land Tribunal, apart from expropriation or transfer to the next generation. Such lands may be mortgaged only with the consent of the special Tribunal, responsible for the regulation of all matters relating to landed property.

Some provisions occur in the law in relation to land transactions after and independently of the reform. The State right of pre-emption remains, so that the State has the means of intervening at a later stage in the establishment of the conditions of land ownership. Corporate bodies can acquire land only with the consent of the Minister of Agriculture; this provision forms an obstacle to any undesired increase in tied land. Parcellings will in future be subject to inspection. Up to 1928 parcellings were under the supervision of the Special Tribunal for regulation of questions relating to property in land. From 1929 onwards they came under that of the Ministry of Agriculture. The administrative authorities must be notified, and the sale contract is only valid if it is submitted to the local authority. If any person has acquired a holding larger than 100 kat. joch as the result of litigation between two parties, and sells it in parcels within five years from that time, he must, in the event of the selling price so obtained exceeding the original purchase price by at least 20 per cent., pay a certain amount to a fund for regulation of property in land. The object of this provision is to make profits from parcelling serve the purpose of the general agrarian policy.

XI. — THE FINANCIAL SOLUTION.

When the war came to an end, the Hungarian State was in a very difficult position; on the one hand it was impossible to postpone agrarian reform; on the other hand it was not the intention to abandon the principle of ownership and thus it was essential to face the fact that large sums would be needed to carry through the reform. A third consideration was that neither the State nor the persons profiting by the reform were in a financial position making payment for expropriated lands at all likely within measurable time. The 432,000 kat. joch acquired through taxation gave rise to no anxieties of a financial kind; in this case the State became the owner without any compensation of the former proprietors, utilised

the land for the objects of the agrarian reform, fixed the rent which the new owner had to pay, and could afford to wait till the financial question could be settled with the new small holders. On the other hand the landowner who had lost a considerable portion of his lands by expropriation must be compensated as soon as possible, not merely for the sake of the principle but because by so doing the equivalent as capital can be as soon as possible utilised for an intensified farming of the remaining land.

The laws of 1920 and 1924 relating to land reforms had not laid down rules for the financial execution on the side of the State, the fact being that for reasons already mentioned it was impossible to do so. The fundamental measure of 1920 merely states the principle, that in the case of an expropriation the owner has the right to full compensation. It also contains provisions relating to the establishment of the value ; it states that the expropriation price may be paid partly in bonds ; that in the event of postponement of payment the former owner may collect an annual rent or amortisation instalment ; that such rent is subject to alteration if conditions change. It appears from these provisions that in accordance with the sense of the law the old and new owners stand in a direct relation with each other, as, so to speak, purchaser and seller of the parcel of land in question ; but that the fixing of the methods of payment, and frequently also of the price, was reserved to the public authorities. Payment may be postponed for ten years by the special tribunal, a procedure which has become a general practice.

It was clear from the above that no immediate payment could be demanded from the new owner. As a rule he had no capital ; and if he had any, it was better applied as working capital. Neither at the time of the carrying out of the reform nor later were credit conditions such that he could obtain credit on terms that he could meet for payment of the expropriation price out of his private resources.

State intervention appeared to be unavoidable ; the only question was in what way the State should intervene : whether it should merely advance money to the new owner, or whether, in relation to the former owner, it should assume the liabilities of the new owner, thus becoming his creditor.

The assumption by the State of the part of intermediary resulted from the social character of the reform and the financial conditions of the last few years. The former owners naturally pressed for an early settlement of the question and became more urgent as the agricultural crisis increased in severity. It was only however in 1929 that the State was in a position to conclude the reform on the financial side.

In 1928 the Government entered into an agreement with the Swedish Match Trust, by which the Hungarian Government pledged itself to give no concessions for a period of fifty years for the manufacture, import or export of matches ; on the other hand it obtained from the Trust a loan of 36 million dollars for the financing of the execution of the agrarian reform on conditions involving payment of 5.978 per cent. in interest.

With the object of the financial execution of the reform a special financial institute was established on a co-operative basis, those co-operative institutions participating which up to that time exercised any activity in connection with agrarian policy. This co-operative organisation enters into legal relationship between the new and the former owner and does away with the direct opposition of the two parties. The State, or rather the co-operative body acting on its instructions, pays the expropriation price to the former owner ; and the amortisation payments are similarly made by it on behalf of the new owner. To render this financing possible,

the amount of the Swedish loan is placed at the disposal of the co-operative organisation.

Up to the present the amount of the payment has remained also undefined, for as already mentioned the fixing of the expropriation price was at the time of the process in most cases postponed out of consideration for the instability of the monetary conditions.

A determining regulation in this sense was added by the supplementary law of 1928.

A distinction was made between agricultural land in the narrower sense on the one hand, and gardens, vineyards and forest on the other. For the former, sixty times the cadastral net return is paid as the expropriation price; as rent the owner takes 2.05 times the cadastral net yield. In the event of the cadastral net return being lower than certain minimal or higher than certain maximal limits, the actual return is not taken as the basis of the reckoning of the sixty times but instead the minimum or maximum respectively. In respect of a property which may be regarded as having originated as war profit, or is owned by a commercial undertaking or by a person who has been convicted of an offence against the State, the special Tribunal, after making a private valuation, fixes the expropriation price, which is in no case higher than the price arrived at by the calculation already mentioned.

If the land was previously used as garden, vineyard or wood or if in the future it will be employed as a site for a house, the tribunal already referred to equally fixes the price and naturally in those cases without limitation, and if necessary even over the 60 times limit.

Expropriation price of land used for agricultural purposes refers only to the land itself; the payment to be made to the former owner for buildings, industrial plant, etc., is also fixed by the tribunal, naturally without the limitation referred to.

The actual payment of the expropriation price is made by the co-operative body, partly in cash and partly in bonds. Two-thirds of the expropriation price of agricultural land is paid in cash; in the case of gardens, etc., also two-thirds of the price fixed by the special tribunal, but at most as much as would be the amount of the two-thirds reckoned on the 60 times basis. The remaining portion of the value of the land, as well as the equivalent of the buildings, plant, etc., is made up in bonds. The amount in cash is paid off in two years. The bonds bear 4 per cent. interest and are redeemable in 52 years.

To give an approximate idea of the return obtained by the former owner of the expropriated land, it may be noted that in Hungary ten "peace crowns" (*i. e.* of pre-war value) are reckoned on an average as the cadastral net income per joch. Hence the owner of an average holding obtained 650 pengös per kat. joch, a sum which was high enough at the prices ruling at the time in Hungary, to make it possible to speak of a full compensation such as is contemplated in the law.

The amount paid by the financing institution in cash and bonds to the former owner must be refunded by those who have obtained land in consequence of the Reform. The principle of division of the whole expropriation price between the new owners, and consequently the valuation of the parcel falling to each owner, is a matter for the decision of the financing authorities in those cases in which the special tribunal has not fixed by a special decision the price of the lands up to the end of 1928. The price thus ascertained of taking over the land must be paid by the new owner within 52 years in equal yearly instalments with 5.4 per cent. interest. If necessary these annual payments may be collected, like taxes, by the authorities.

The most difficult part of the agrarian reform, namely its financing, was thus achieved. The former owners were, generally speaking, satisfied with this method of compensation. At the time of the coming into force of the law and also during the period of its principal application, however, the monetary and credit relations were actually thoroughly unpropitious for financial operations of this kind ; on the other hand since 1929 the situation is quite different in consequence of the borrowing already referred to. From this point of view the temporary postponement of the financial regulation was to a certain extent advantageous. But from 1929 onwards an other difficulty occurred. The cadastral net return of the land was at the time ascertained under such conditions as may be considered to be normal on average. Since this sum had been taken as the basis of the determination of the expropriation price by the law of 1928, these prices and accordingly the charges incumbent on the new owners were in correspondence with the prices of land under conditions of normal farming. At the present time it is impossible to speak of normal conditions, the agricultural situation is serious and becomes increasingly so from the fact that cereals and in the first instance, wheat, form the main source of the revenue of the farmer, including the small holder. The net return from the land at the present time remains essentially below the fixed figure of the cadastral net return, and the expropriation price reckoned on the basis of the latter is very often higher than the price for which the same land could be obtained to-day in the open market. From 1929 and especially from 1930, the prices of land have fallen to an extraordinary degree, and in some districts by 50 per cent. It is not surprising that the new owners feel themselves to have been cheated, although they naturally used every effort to obtain land through the reform. The postponement which has occurred renders the mortgage rates, the rents, etc., an almost intolerable burden.

It was no easy matter for the State to find a remedy for this situation, since the only possible remedy meant the shouldering of some part of the burden itself ; there could evidently be no curtailment of the rights of the former owners based as they were on the law. As the agricultural situation did not improve, there remained however nothing to be done but to reduce the payments. In this year 1931 an Order was made enacting a reduction of 33 per cent. on the total payments due from the new owners for 1930. This provision leaves undisturbed the expropriation price and the other financial arrangements and relates only to one year. It is however to be assumed that the same procedure will be followed, so long as the position of the new owners in regard to farming income does not improve ; on the other hand it will be only fair for them to pay a larger proportion of their debts as soon as the agricultural situation makes this possible.

XII. — THE AGRICULTURAL SITUATION AFTER THE AGRARIAN REFORM.

(a) *Distribution of types of holding.*

No precise statistics exist on the distribution of land after the reform, and only approximate statements, based on the data available, can be made as to the changes thereby introduced into conditions of holding. About 1,112,000 cadastral joch changed hands as a consequence of the reform. According to the statistics referring to the end of 1928, when the reform was already being carried out, small holdings of less than 100 kat. joch, absorbed in all 8.3 million kat. joch, corresponding to about 51.35 per cent. of the land as a whole. Taken by itself this figure would seem to indicate a somewhat low proportion of small holdings, but it has to be realised that there has been in fact a 16 per cent. increase in the area devoted to small holdings.

This would come out more clearly if it were not, so to speak, masked by the fact that the proportion of small holdings had been reduced as a result of the territorial changes made under the Peace Treaty, and this lowered percentage had first to be readjusted before the effect of any increase could be observed.

The increase in the small holdings took place at the expense of the large farms, the total area of which was thereby reduced by 150,000 kat. joch, and remained at 4,960,000 kat. joch, or 30.4 per cent. of the whole lands. Thus 2,900,000 kat. joch remained over for the medium sized holdings between 100 and 1000 kat. joch.; or 18.2 per cent.

The proportionate division of the arable land between the classes of holdings is approximately: on the small holdings, 64.3 per cent., on the medium-sized, 15.3 per cent. and on the large holdings, 21.4 per cent.

Important changes have been effected by the reform in respect to the tied lands as shown in the following table:

	Extent in thousands of kat. joch in	
	1929	1930
Public lands	220.1	234.6
Owned by the communes	662.1	713.7
Owned by schools and other institutions	202.6	183.7
Ecclesiastical property	908.6	015.2
Entailed property	1,102.1	832.5
Property under communal farming	652.3	768.4
Property of share companies	150.3	137.5
	3,898.1	3,785.1

At first sight the reduction in the tied property seems to be insignificant: 113,000 kat. joch or 3.8 per cent. of the former extent. The various kinds of tied property enumerated above cannot however be treated alike, as from the point of view of a social agrarian policy they must be quite differently judged. The public lands consist partly of model farms and stud farms, partly of smaller parcels attached to agricultural schools, etc. Land belonging to the communes is either in the form of small tenancies held by humble people, or it is communal grazing land, or it forms the supplement in kind to the salary of certain officials employed by the commune. In this last case it is again a question of small parcels worked for the most part by tenants of the peasant class. The lands under communal farming are usually grazing lands or woodland and the rights of usufruct ordinarily attaching to land of this character are enjoyed by the members who are naturally either humble people or peasant-farmers. Hence there remain as forms of tied property that can undergo reduction for the purposes of agrarian policy, ecclesiastical property, entailed lands and property of share companies. The total area of these in 1921 was 2,161,000 kat. joch, while in 1929 it was 1,885,000 kat. joch, equivalent to a reduction of 13 per cent. Against this must be set, in regard to the useful types of tied property, an increase of nearly 13 per cent. The much disputed entails have diminished by 270,000 kat. joch, or 24.5 per cent., so that 5.1 per cent. of the total area remains in their possession, but only 3.5 per cent. of the arable lands. In all 8.5 per cent. of the arable land belongs to the ecclesiastical and entailed lands, that is, to the most disputed forms of tied property. Land in the possession of share companies, in spite of the unrestricted possibilities of expropriation (see page. 349), has undergone reduction only in a limited degree because in recent years in consequence of the

indebtedness much land was sold by public auction and passed into the possession of creditor banks.

A decided improvement in conditions has been the increase in small tenancies which has been one result of the reform: the area so held has been increased by 157,000 kat. joch, or an addition of about 43 per cent.

Approximately 407,000 human beings have experienced the benefits of the reform, taking the agricultural lands only in the narrower sense; hence more than every fifth person is gainfully employed in agriculture. A clearer idea is obtained, if the 482,000 homesteads which are the result of the reform are taken into consideration.

(b) *Production*

In the subsequent account of the conditions of Hungarian agriculture it must always be kept in view that a definite causal connection between land reform and the present position cannot be proved since during the same period other changes of importance have taken place which might equally have affected the situation, whether acting in the same direction as the reform or in an opposite one. Any comparison made between past and present output may thus be regarded as changes which have come about during the time of the execution of the reform, but never as a consequence of it.

Comparison of the average crops over the whole arable area.

	in quintals per hectare	Average for 1921-25	1929 (1)
Wheat		12.0	13.0
Rye		10.6	12.2
Barley		10.9	14.3
Oats		10.4	13.6
Potatoes		59.9	76.6
Maize		15.1	16.0
Sugarbeet		182.9	203.4

(1) A year of record crops.

Although the year 1929 was a more favourable season for root crops than usual a rise in the crop averages can be established independently of that fact. It appears however from other statistical data that this rise is less noticeable in respect of small holdings.

Up to 1929 the use of artificial fertilisers constantly increased, especially on the small holdings, as the result of State encouragement, large sums being allocated so that the small farmers might obtain artificial fertilisers on special terms of preference. On discontinuance of these grants and with the difficult position of agriculture a diminution in the use of these fertilisers resulted. The area to which fertilisers were applied was in 1927 in percentage of the whole arable area as follows:

	Farm manure	Chemical fertilisers	Total
Holdings under 20 kat. joch	25	1.5	26.5
» between 20 and 100 kat. joch	21.3	4.1	25.4
» between 100 and 100 kat. joch	19.5	13.7	33.2
» over 100 and 1000 kat. joch .	19.7	19.7	39.4

The State also allocated large sums for supplying selected seeds to small holdings. There is an increasing recognition of the importance of seed which is completely pure, evidenced by the growing number of the investigations carried out on the State seed testing stations.

As regards employment of machines there seems to be no special progress. The number of tractors has risen since 1922 from 1000 to 6000, but lately there has been a slackening in this respect also. There has been a reduction in the number of threshing machines since 1924. At present no attempt is being made to substitute machine labour for human, the idea being to avoid any swelling of the unemployment that exists. The farm machine industry is much developed in Hungary; in 1929 the values were for imports, 6,039 thousand pengös, for exports 15,547 thousand pengös, showing thus a very considerable export surplus.

There was an increase in land improvements (drainage and irrigation) up to 1928, and a decline in the following years; on the other hand operations of stream regulation were still on the increase in 1929. One of the great problems of Hungary consists in the alkali land which extend over an area of 1,500,000 kat. joch (1).

The most interesting question with reference to the agrarian reform is perhaps whether or to what extent the present relation of the different branches of arable farming has altered. The proportion of the crops to the whole arable area was as follows:

	1925	1926	1927	1928	1929
Wheat, rye, barley	49.0	50.7	51.1	51.8	49.5
Maize	20.9	20.6	20.3	20.0	21.0
Potatoes, sugar-beet and fodder beet	8.4	8.0	8.1	8.2	8.8
Rapeseed, tobacco, hemp, flax	1.0	0.9	1.0	0.9	0.8
Fodder maize and other forage crops	12.0	11.0	11.0	10.8	10.4
Vegetables	0.2	0.2	0.3	0.3	0.3

No important changes appear. There is equally little modification as regards the types of crop grown under the various heads.

An increase is noticeable in the output of industries engaged in transformation of agricultural products. The yearly outputs in thousands of hectolitres, or in quintals, are as follows:

	1925	1926	1927	1928	1929
Beer	612	454	690	671	601
Spirit	279	320	354	417	377
Sugar	2,026	1,663	1,750	1,867	2,200
Tobacco, preparations of	79	112	113	118	120
Milled products	12,948	12,642	13,214	14,323	15,065

(1) The return of the alkaline lands of Hungary was made in 1927. The total area of alkaline lands according to this return may be estimated at about 1,300,000 kat. joch, including 800,000 consisting of compact clay, poor in calcareous substances and 500,000 consisting of soda and basic carbonate. During the years 1928-29-30, the State Department for the improvement of alkaline lands has improved 10,000 kat. joch of clayey soils poor in calcareous substances by adding lime. The improvement of the soils formed by the basic carbonate is the subject of investigations and enquiries made on a large scale.

For the dairy enterprises an increase is also to be noted, indicating intensification.

There has been no essential change in the organisation of labour since the war. Wages remain below pre-war level although they have not fallen so much as prices of products and they represent for agricultural economy a much heavier burden than before. There is much unemployment especially within the last two years. The general opinion, which cannot however be precisely substantiated, is that the reform has diminished the openings for work.

(c) *Production Costs.*

(aa) *The Indebtedness.* — In any account of the organisation of agricultural credit in Hungary a distinction must be made between mortgage and personal credit. The mortgage credit needs of the small holding are met in the first instance by the savings banks and the provincial banks and secondly by co-operative mortgage credit institutions and co-operative credit associations, or by the Central Union of these. In the case of the large farm similar requirements are met first by the mortgage credit institutions and the large banks of the capital, and secondly by the provincial financial institutes.

The personal credit of the small holder is mainly provided by the co-operative societies; these cannot however cover the whole requirement, so that the other financial institutions are largely called upon. The medium-sized and large property also have their own co-operative credit societies, but in spite of that, credit is mainly obtained from the savings banks. The most usual form of personal credit for the small holder also is still the bill of exchange, although an effort is being made in the case of the co-operative societies to return as far as possible to the loan on promissory note. The State supplies the co-operative societies with considerable capital, its object being to facilitate the supply of necessary credit to the small holding and in particular to the small holding which has been created by the reform. The Central Co-operative Credit Union also makes every effort to collect capital.

Although there is continued improvement in the capital assets of the co-operative credit societies the position is still far from satisfactory.

According to a farm statistical return made in 1927, which however referred only to a certain number of farms taken as typical, the following was the position as regards agricultural indebtedness:

Holdings	Long term			Short term			Chattel		
	Loans								
	Indebted- ness	Interest charges	Rate of interest	Indebted- ness	Interest charges	Rate of interest	Indebted- ness	Interest charges	Rate of interest
	pengos per kat. joch			pengos per kat. joch			pengos per kat. joch		
Small	58.37	5.88	10.0	22.89	2.05	12.88	—	—	—
Medium	52.58	4.62	8.78	41.59	4.32	10.38	5.23	0.49	9.3
Large	29.66	2.85	9.64	11.97	1.02	8.52	2.70	0.16	16.59

Since 1927 the situation has become decidedly aggravated. Later figures relate only to mortgage loans. These amounted at the end of 1928 to 84.3 million pengös, and at the end of 1929 to 1,328 million pengös. Although the increase is in part due to the circumstance that personal debts were converted into mortgage debts, this factor is only a small one and some anxiety must be felt on account of the rapid growth of indebtedness.

The total mortgage indebtedness (apart from loans and other liabilities) was :
in 1928, 1,160 million pengös, and in 1929, 1,541 million pengös.

Of these sums .

- 203 per cent were realised by joint stock banks and savings banks,
- 25.7 per cent were realised by land mortgage credit co-operative societies,
- 54.0 per cent were realised by co-operative credit societies.

It may be seen from the statistics of indebtedness that although a smaller fraction (32.8 per cent.) of the whole area of small holdings is encumbered than of the medium-sized holdings (35.6 per cent.) or of the large holdings (42.9 per cent.), yet in every other respect the indebtedness of the small holding, and in particular that of the holding less than 50 kat. joch, is the most serious of all, *viz.* :

1. Of the total *indebtedness* 59.3 per cent. falls on the holdings under 50 kat. joch and 64.5 per cent. on the holdings under 100 kat joch ; on the other hand the proportion of the former in the total *area* is only 46.0 per cent., and of the latter only 51.1 per cent

2. The larger the size group of the holdings, the smaller is the indebtedness calculated on the average per kat. joch ; the indebtedness in the case of the small holding is thus nearly double that of the large holding ; that is to say, on every kat. joch of the encumbered areas there fall in mortgage charges :

in the case of the small holding under 50 kat. joch	about 375 pengös
„ „ „ „ small holding between 50 and 100 joch.	271 „
„ „ „ „ medium-sized holding	234 „
„ „ „ „ large sized holding	143 „

Taking the average of all the size categories together there fall on every kat. joch of the encumbered areas 262 pengös in mortgage charges ; this corresponds at the present (1929) prices of land to a 40 per cent. charge on an average, consequently the encumbered part of the small holding was in 1929 burdened to the extent of more than half its value.

3. On an average 77.2 per cent. of the indebtedness consists in loans. Of these the loans repayable in instalments naturally represent the form of indebtedness less burdensome in comparison. The position was as follows :

in the case of small holdings under 50 kat. joch	11.4 per cent.
„ „ „ „ small holdings between 50 and 100	20.9 „
„ „ „ „ medium-sized holdings	29.9 „
„ „ „ „ large holdings	46.0 „

respectively represented the proportion of loans repayable by instalments.

(bb) *Prices of Manufactured Products.* — The price-index of the agricultural products, including live stock products, fell during 1930 from 130 to 97 ; on the other hand there fell during the same time the index of :

Groceries from 147 to 138 ; products of the milling and sugar industries from 110 to 103 ; products of other industries from 139 to 137.

From these data it is easy to arrive at a conclusion as to the price situation of the manufactured commodities required for agricultural production.

(cc) *Wages of Labour.* — The unsatisfactory conditions in regard to farming income on the one hand, and the large over supply of labour on the other have a depressing effect upon wages. Wages have been :

	Male workers	Female workers
Without board :		
Spring	2.86	2.12
Summer	4.37	3.17
Autumn	3.20	2.31
Winter	2.34	1.86
With board :		
Spring	2.13	1.52
Summer	3.48	2.37
Autumn	2.42	1.73
Winter	1.77	1.19

(dd) *Marketing and Price Conditions.* — As already stated no noticeable changes have been effected by the agrarian reform in the kinds of crops under cultivation or the branches of farming followed. The main product remains as before wheat, alike for the small holder as for the large holding. No data are available as to the proportion coming on the market of the production of the various size-groups of small holdings. The general opinion is that holdings under 20 kat. joch produce only for family consumption, the other larger holdings also for the market.

It is also difficult to state how far the reform has had an influence on external trade. This is the less possible to estimate, as during the post-war years before the reform a marked influence was exercised on the export and import trade by inflation, a factor the effect of which it is not easy to measure and which disturbs the comparison with present day conditions. The figures for 1913 as more normal serve as a better basis, and are accordingly shown here side by side with the figures for the year subsequent to the reform :

	1913	1925	1926	1927	1928	1929
			in 1000 quintals			
Live stock products	1,088	641	761	565	430	471
Cereals	13,372	7,381	9,961	7,772	7,386	11,087
Root crops	11,233	9,905	9,345	7,693	7,847	12,532
Fruit	117	314	211	230	264	330
Vegetables	443	508	494	307	393	631
Vine products . . .	605	30	46	70	146	389
Total agricultural exports	28,847	19,896	21,932	17,886	18,070	27,519

Apart from live stock products all other branches of agricultural export have regained the pre-war level. It must be remembered that the pre-war export was primarily directed to Austria which was then in a customs union with Hungary, while the export of the present time is made over tariff frontiers. Accordingly it is under more difficult conditions that the pre-war figures are reached, and in some cases surpassed to-day. The proportion of agriculture in the total export remained during the period nearly the same, the reason being that with the steady fall of export prices the increase in the quantities does not tell in the total values.

	1913	1925	1926	1927	1928	1929
Total value of the agricultural export in million pengös .	785	623	682	604	586	770
Proportion of the agricultural export to the total export in %		73.4	77.2	74.8	71.9	74.0

The most pressing question for Hungary is the marketing of its most important product, wheat. There are different schemes for the improvement of the situation in this respect, among which the introduction of a system of warehouses is one. All that has been done so far is that cereal producers obtain a payment from the State of 3 pengös per quintal of rye. This payment is made however not in cash but in warrants which may be used for payment of taxes. The disbursements for this purpose are covered in the budget by the flour tax, the increase in the duty on tea and coffee, as well as by the raising of postal charges.

The price situation of agricultural products is shown by the following figures :

	Wholesale trade index taking 1909-1913 = 100 agricultural products	other products	Index of the agricultural price-scissors
31 December 1925	107.2	142.1	75.4
31 December 1926	112.6	137.0	82.2
31 December 1927	127.5	140.3	90.9
31 December 1928	121.7	139.1	87.5
31 December 1929	103.4	129.0	80.2
31 December 1930	83	114.5	73.3

Statistical material relating to farms on the basis of which the position as regards profit capacity might be established is available only for 1927 and only then for the large and medium-sized farm holdings. The income of the farms investigated was in weighted average 14.6 pengös per kat joch. This corresponded to an interest return of 1.24 per cent., if the sale value and not the yield value of the land is taken. Of the 82 farms under review 35 per cent. closed the year with a loss. Taking into account all that may be inferred from the data already given in respect to the situation of agriculture since 1927, the conclusion seems unfortunately well grounded that the position has since then changed essentially for the worse.

On the other hand agriculture remains still the main source of the national income ; in 1929 the various contributions under this head were as follows : 1.97 milliards pengös from arable cultivation and live stock farming, 0.80 milliards vine-growing, 0.55 milliards from fruit and market garden produce, and 0.02 milliards representing forestry products.

(d) *Other Conditions.*

Subtracting from the total number of those who obtained land as a result of the agrarian reform, all those who obtained a dwelling house site only and those who were already landowners and only gained an extension of their property, there remain 250,000 as the number of those who became thereby owners of small or very small holdings. In spite of this unemployment is very rife, and the number of the unemployed is estimated at 250,000 among whom there are of course some who are not entirely without means of livelihood, but during the farming season cannot earn enough, even with the subsidiary jobs that may occur, to keep themselves and their families during the winter. Unemployment insurance is in force in Hungary alike for agricultural as for industrial workers. Other branches of social insurance have been introduced to a more limited extent for agriculture than for industry, but a general introduction of social insurance charges would probably press too heavily on agriculture in Hungary at the present time.

Accident insurance is compulsory for farm servants, for manual workers employed on the farm and for persons engaged in handling farm machines. The benefits

of the State agricultural insurance fund are however extended, on a voluntary basis, to all the other categories of farm workers and to the small holders. The question of the further extension of compulsory insurance of farm workers has been for a long time under consideration.

There is noticeable no marked emigration from the country into the towns, a fact which is fully intelligible since industry has at present no absorption capacity for workers. The opposite phenomenon however has not appeared, namely the return to the land as a consequence of the agrarian reform.

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CREDIT

The International Agricultural Mortgage Credit Company: General Scope and Organisation.

I. — INITIATION OF THE STUDY OF INTERNATIONAL AGRICULTURAL CREDIT.

The idea of international agricultural credit took shape first in 1924, when, in view of a very considerable shortage in the grain harvests and the anxiety as to the serious consequences, not only economic but also social and political, that might result therefrom, the International Parliamentary Conference of Commerce urged the necessity of a joint interstate policy with the object of making advances to the agricultural countries of Central and Eastern Europe of the funds required by them for the revival and intensification of their production. The question resolved itself into that of the possibility of a transfer of capital from one group of States to another and it was clear that full consideration and study must first be given to the various aspects and factors in the problem, including the guarantees and the causes that were operating adversely to the circulation of money. The necessary enquiry into all these factors was in 1926 entrusted to the International Institute of Agriculture, as the body which by its constitution gave full assurance of impartiality, while the sources of information at its command would ensure an accurate fulfilment of the proposed enquiry (1).

(1) The various stages in the work accomplished by the International Institute of Agriculture in this respect and the documentation on the object relating to the period 1925-29 are set out in the volume entitled "Documentation relative au crédit agricole internationale" published in 1930. In order to ensure a more complete investigation of the subject and to obtain the advantage of the opinion of the experts in agricultural credit, an Agricultural Credit Section was formed in the International Scientific Council of the Institute and at the end of 1927 an international banking enquiry was instituted with the object of collecting the material fundamentally required in view of the projected organisation of an international service of agricultural credit. In this connection reference may be made to the publication "Crédit agricole international. Principaux résultats d'une enquête bancaire effectuée par l'Institut International d'Agriculture". The terms of the problem were also set out in a "Note sur le crédit agricole international" presented to the Conference, preparatory to the Second World Wheat Conference, which was held in Rome on 26 March 1931.

It may be noted that at this Conference the Institute was formally requested to continue its studies with reference to agricultural credit, and to endeavour to promote the widespread organisation of short term credit, in view of the increasingly urgent demand for credits of this kind, as the result of the agricultural crisis and of the difficulties found in the marketing of products in many countries. With this object a meeting was arranged in Rome on 12 and 13 August 1931 to consider the formation of an International Bank of Agricultural Credit at which the representatives of 20 European States were present. At this meeting there was a full discussion of three documents consisting of drafts of an agree-

It may be at once noted here that although the original anxieties were allayed by the more abundant crops of 1925 and succeeding years, the idea of international agricultural credit was by no means abandoned; on the other hand it attracted even greater attention and interest, in connection with the credit needs due in part to the events of the years immediately following the war, and in part to the economic crisis which began to make itself felt.

The most insistent demand for credit came from the countries in which agrarian reform had been effected. In these countries the large class of small holders which had come into existence as the result of the breaking up of the large estates made an appeal for funds for the equipment and proper working of the new farms. It was impossible to obtain the means required within the countries, where frequently the economic straits of the producing classes were paralleled by the financial straits of the State.

The far reaching and gradual process of specialisation and industrialisation of crops which constitutes one of the most salient features of modern production, the increasing application of the principles of agricultural chemistry together with the mechanisation of agriculture, rural electrification and in general the more scientific management and equipment of farms, which the severe competition has forced on farmers, are all factors which have contributed to the revival of the demand for credits.

When the world economic crisis due to causes mainly agricultural supervened, the problem became more complex in so far as in addition to the capital requirements for the needs already mentioned there has been a demand for funds to meet the fresh difficulties and requirements and in particular for changes in and adaptation of crop systems made necessary by the new price level and for organising the marketing of products on improved lines.

It has in fact been increasingly realised that in the present acute phase of the crisis sound production is not enough that it is essential also to market advantageously, and that the principles of systematic and opportune marketing cannot be dissociated from those of food cultivation methods. Hence have arisen a whole new series of credit needs, connected with the financing of sales and having reference to the building of warehouses, refrigeration plant, elevators, etc., and to the organisation of advances on products, warrants, etc. Thus the credit demand for the maintenance of the processes of production is supplemented by similar demands for the support and financing of the distributive process which was formerly regarded as of less importance.

To conclude, after the war by a combination of circumstances the appeal for credit on the part of the rural classes assumed new forms and developments that had not been anticipated. It is enough to note that in France, in order to meet the applications for intermediate credit required for farm improvements, and for the extension or repair of rural buildings, purchase of stock and farm machinery, it has been necessary to place at the disposal of the National Bank of Agricultural Credit (*Caisse Nationale de Crédit Agricole*), in accordance with the law of 15 August 1928, a new fund of 500 millions of francs. In Italy in the three years 1928 to 1930 the National Consortium for Agricultural Improvement Credit received 812 applications for loans for rural buildings, land improvements, roads, irrigation plant, electric and otherwise, plantations, etc., amounting to a total of 1,507,099,554 liras.

ment between Governments for the granting of special exemptions and facilities, a constituent charter to be signed by national banks agreeing to become shareholders in the International Bank, and the terms of constitution of this Bank. The meeting was concluded by the signing of a final protocol approving the initiative taken by the Institute.

Agriculture, in fact, has not obtained the sums required to meet its needs ; the reason for this is primarily the inadequacy of the funds at the disposal of the States — which have none the less succeeded in establishing improved credit systems — and in the second place the fact that private capital is not easily found for agricultural investments which are not very remunerative.

The position of the countries of Central and Eastern Europe is peculiarly difficult, and will now be examined.

II. — THE SPECIAL AGRICULTURAL CREDIT NEEDS OF THE CENTRAL AND EASTERN EUROPEAN COUNTRIES.

The outstanding fact that has brought about a new and very considerable need for agricultural credit in this group of countries is the agrarian reform (1). This reform consists essentially in the subdivision of large properties, belonging to the State, to public or ecclesiastical institutions, or to private persons, followed by the assignment of these lands under varying conditions in small lots to cultivators. It is difficult to calculate precisely the results of this movement, which is one of the most striking consequences of the profound upheaval that followed the war in the economic and social life of Europe. Not all the data necessary are at hand, and also at the present time and in some countries the movement is still in course. An idea of the extent of the reform may be gained if it is calculated quite roughly that there have already been subdivided and distributed more than 10 million hectares of land. Taking into consideration the agrarian revolution in Russia, where large private property has altogether disappeared, Latvia and Estonia where the reform was equally radical, Lithuania and Rumania (2) where large private property is reduced to a proportion varying round 10 per cent. of the total arable area, Czechoslovakia and Yugoslavia, where large property is equally reduced, it may be said that the distribution of the landed property and the post-war agricultural and social structure are very different in the countries of Eastern Europe from what they were before the war, and that the number of small holders has much increased. On a rough calculation this number may be estimated at present as about three millions. It is easy to understand that this mass of small holders find themselves in serious difficulties. The cultivator has been, as it were, abruptly transformed into the farmer, but he is none the less for the most part without means and without any real agricultural training, and certainly not in a position to provide from his own resources equipment for his farm which requires working capital and capital for improvements. The technical and financial assistance provided by certain Governments has proved on the other hand quite inadequate. The serious results thereby entailed on the working and productivity of the farming enterprise can only be rectified by the granting of credits suited to the different cases.

This situation has been aggravated from 1929 onwards by the crisis of markets and consumption, which has made sale of products difficult, has created large stocks and caused indebtedness to increase very noticeably. According to recent investigations, the debt burdening the agriculture of the States in question has been estimated in dollars as follows : Bulgaria, 41 millions ; Estonia, 23 ; Yugoslavia, 73 ; Latvia, 49 ; Poland, 251 ; Rumania 240 ; Hungary, 245. For these States taken together, the total is thus over 900 million dollars of debts with varying periods of

(1) The Agrarian Reform. — 1. Austria — Finland — Latvia — Lithuania — Poland. International Institute of Agriculture, Rome 1930.

(2) PERRINI Emilio. The Agrarian Reform in Rumania. *International Review of Agriculture*, No. 3, March 1931, International Institute of Agriculture, Rome.

expiry, burdened, except in certain rare cases, with extremely high rates of interest. The debt per hectare of land under cultivation is 10.97 dollars in Bulgaria; 8.12 in Estonia; 5.9 in Yugoslavia; 14.71 in Latvia; 10.24 in Poland; 14.02 in Rumania; 33.74 in Hungary.

As regards interest, it will be sufficient to give some examples :

In Poland, for short term credit, the Agricultural Bank of the State fixes a rate of 10 $\frac{1}{2}$ per cent. for farmers. The rate fixed by private persons is usually excessive.

For long term credit, the Agricultural Bank of the State, the Bank of National Economy and the Mortgage Credit Company fix a rate higher than 8 per cent.

In Bulgaria the rates of interest for the different types of agricultural credit are as follows :

At the Agricultural Bank of Bulgaria :

for personal loans against promissory notes.	10 per cent.	per annum		
for loans on warrants	10 »	»	»	»
for mortgage loans	12 »	»	»	»
for loans for improvements	10 »	»	»	»
current accounts on warrants	10 »	»	»	»
» » on securities	10.5 »	»	»	»

At ordinary banks, farmers usually pay an interest of from 15 to 16 per cent. and to private persons from 16 to 20 and even more.

In Rumania the special agricultural credit institutes are inadequately provided with funds (1) and hence the farmer has been obliged to try to obtain on the open market the capital necessary for cultivation of lands, and succeeds in doing so from commercial banks by paying a rate of interest that fluctuates from 18 to 25 per cent., from private persons at a rate of 20 per cent., and from their own suppliers. This last method is most burdensome, as the terms are usually usurious. In general, this credit is obtained under the form of an advance on growing crops, a form which deprives the farmer of all freedom in marketing as well as of the greater part of the profit on the enterprise.

In Yugoslavia, the rates are from 9 to 12 per cent. in the region where the co-operative movement is organised, and as much as 14 to 20 per cent, where there is less development of co-operation. In the latter case, usury is not uncommon, and sometimes, when the different expenses connected with a loan are added together, the result is a 50 per cent. charge.

In Latvia, the loans made to farmers by the State Land Bank and by the Bank of Latvia are stated to be entirely inadequate; the inadequacy of the funds at disposal is attributed to the "unduly slow accumulation of capital in the country". The absence of cheap credit is pronounced to be the most serious obstacle to any measures for remedying the agricultural crisis.

In view of the new and serious situation in which the countries referred to are placed as regards the sale of their surplus agricultural products, the Agrarian Conferences of Warsaw and Bucarest, held in August and October 1931, recognised the urgency and advisability of providing in these countries a better organisation for the marketing of these products and in particular of cereals, and of setting up for the purpose special institutions for regulation and control of the export trade so as

(1) JUVARA D. : *Le problème du crédit agricole en Roumanie*. Paris, Librairie de Jurisprudence Ancienne et Moderne, 1928.

to meet as adequately as possible the requirements of the markets of the importing countries (1).

By such a system gluts on the international market and consequent fall of prices would be avoided. Clearly however the essential condition for the carrying out of such a plan is that farmers should have sufficient funds to enable them to distribute their sales over the year, instead of being compelled to concentrate their offerings on one limited period. Crop transformations though not always practicable are in some cases indispensable, and usually require a generous employment of capital which in times of crisis must necessarily be obtained on credit. From enquiries on the subject recently made by experts (2) it appears essential to develop intermediate credit in certain countries where it is either not in use or only to a very limited extent. The essential purposes of intermediate credit include the rationalisation of farm management and of methods of production, decrease of production costs, a more adequate organisation of sales and the improvement in the quality of products.

Two forms of intermediate credit may be considered in relation to the concrete needs of the countries of Central and Eastern Europe. The former would include loans required for purchase of chemical fertilisers, selected seeds and various farm requisites, loans for the fattening of stock, for payment of wages, etc., in short all the expenditure to meet which the farmer is frequently obliged to sell his products at an unfavourable time and particularly immediately after the harvest. This type of credit, to be given for a period not less than 9 months and not more than 18 months, would do much not only to improve the situation of the cereal market, but also to increase the purchasing capacity of the rural producing classes by increasing the return from the sale of their products.

The second form of intermediate credit contemplated would include loans for agricultural and land improvements, to be made for a period not exceeding a maximum of 5 years; such loans should be earmarked for:

- (a) the purchase of dead farm stock;
- (b) purchase of live stock and in particular of breeding animals;
- (c) repairs, alterations and enlargements of farm buildings and any improvements the cost of which admits of speedy amortisation;
- (d) improvements relating to pools, vineyards, gardens, apiaries, etc.;
- (e) land clearing operations;
- (f) carrying out of certain agrarian operations, such as consolidation of parcels, etc.;
- (g) conversion of burdensome debt charges other than with credit institutions.

(1) Among the measures contemplated for meeting the crisis in agriculture, and particularly in wheat growing, the outstanding one in the group of countries under review is that for the establishment of institutions for the rationalisation of production and of exportation of products and in particular of cereals. The programme of these institutions should include the study of markets, an information and publicity service, control of merchandise and of packing systems, financing of the organisations which make provision for direct purchases from growers as well as for export business, financing of erection of warehouses and silos. The institutions however are not to engage themselves in export operations, which should remain in the hands of already existing institutions, agricultural co-operative societies, rural banks, associations of exporters, and in those of individual exporters. Institutes for the export of agricultural products were set up in Hungary and Poland in 1929, in Rumania and in Yugoslavia in 1930, while in Bulgaria there was established in December 1930 a Board for Purchase of Cereals for State Requirements, and in February 1931 an Institute for the export of the chief agricultural products was set up. For fuller details of these two last named organisations, see respectively the *International Review of Agriculture*, No. 12, December 1930 and No. 4, April 1931.

(2) Meeting of Experts of Central and South-Eastern Europe, Warsaw, November 1930. Memorandum on the problem of intermediate credit.

It will be seen that the greater part of these loans are designed to improve the equipment of the farm and to rationalise its working and in short tend to bring about a more economic organisation of the undertaking.

Since it is impossible in the majority of the Central and Eastern European countries for farmers to obtain intermediate credit for the purposes indicated, they have been obliged to have recourse to short term credit. Subsequently as they are not in a position to meet their liabilities within the fixed term they have been frequently under the necessity of contracting new loans at a rate which is usually exorbitant and in this way their situation has become extremely precarious and difficult. It may be added that it is precisely at this stage in the crisis that it is frequently most necessary to proceed to investments, such as change in the cropping systems and conversion of burdensome debt charges, calculated to effect the diminution of expenditure on management which will counterbalance the decline in the prices of products.

As regards the majority of these countries it has been recognised to be impossible to find an adequate national solution of the credit problem, and increasing stress has come to be laid on the advisability of an international solution.

As has been shown the technical bases for such a solution have already been supplied by the action of the International Institute of Agriculture. It remained to provide for the more strictly financial side, which has been engaging the attention of a special sub-committee for agricultural credit of the Financial Committee of the League of Nations. The International Institute of Agriculture was officially invited to take part in the work of this specially appointed body. A close contact was maintained with the Sub-Committee for Agricultural Credit of the Commission of Enquiry for European Union, and a draft convention, constituent charter and statutes were prepared for the establishment of an International Agricultural Mortgage Credit Company (1). These documents have obtained the approval of the Council of the League of Nations and were on 21 May 1931 signed by representatives of the following Governments: Belgium, Bulgaria, Czechoslovakia, Estonia, France, Germany, Greece, Italy, Yugoslavia, Latvia, Luxemburg, Poland, Portugal, Rumania, Switzerland, Hungary. The Convention remained open for signature up to 30 September and in the interval the following countries also signed Austria, Denmark, Finland, Lithuania, Netherlands, Spain, Great Britain and Sweden. Ratification of the Convention on the part of the respective Parliaments is still required and should be made before 31 December 1931.

The fundamental lines of the organisation of the new Bank will now be described.

III. — ORGANISATION OF THE INTERNATIONAL AGRICULTURAL MORTGAGE CREDIT COMPANY.

It will be opportune to recall the general position which led immediately to the consideration of the question. The attention of Governments was first drawn to the subject by the Preliminary Conference with a View to Concerted Economic Action. It was considered that the shortage of capital forms a serious hindrance to the development of commercial relations between industrial and agricultural countries, and the Conference expressed the hope that a satisfactory solution might

(1) International Agricultural Mortgage Credit Company. Convention, Charter and Statutes approved by the Council of the League of Nations and signed on May 21st, 1931, and other relevant documents. League of Nations, 22 May 1931, Geneva.

be found in the better organisation of agricultural credit. On the other hand, the Financial Committee of the League of Nations laid emphasis on the importance to industrial and agricultural States alike of alleviating the burdens which weigh on agricultural production in various countries. Further the Sub-Committee on Agricultural Credit of the Commission of Enquiry for European Union stated :

“ that lack of capital was one of the major factors which prevented the agriculturist from changing from those crops of which there is at present an excess to those the consumption of which was tending to increase. Moreover all measures aimed at raising the standard of living in those European countries where the standard is at present relatively low must help to increase the demand for the higher value agricultural products, such as meat, milk, fruit, etc. The granting of credit, and more especially the granting of credit where rates of interest are now abnormally high, would therefore help, on the one hand, to bring about those changes in production and, on the other, that increase in demand which are alike necessary for a general improvement in agricultural conditions. They would also certainly have the effect of increasing the purchasing power of agriculturists, and particularly their demand for industrial products ”.

With these primary considerations as basis, the Financial Committee of the League of Nations prepared the plan of the International Agricultural Mortgage Credit Company which took the form of the Convention already mentioned, open for signature by all the European States Members of the League. This Convention in fact assigned to the new organisation, which is placed under the auspices of the League of Nations and has its registered office at Geneva, a threefold function as follows : (a) to alleviate the burdens which weigh on agricultural production in various countries, (b) to diminish the working expenses which at present absorb too large a share of the profits, and (c) to increase the purchasing capacity of the agriculturists.

This international mortgage institute is constituted in the form of a limited liability company, since it is considered that it is desirable to adopt to the greatest possible extent a normal business procedure such as is familiar to the general public. The company will not however seek to make profits beyond what is necessary to give an adequate return on the capital. It is primarily intended to be of a public utility company, designed to benefit agriculturists.

The objects of this company are :

1. To make long-term loans with amortisation, or medium-term loans with or without amortisation, to mortgage or agricultural credit companies or institutions which, either directly or through other companies having their registered offices in the same country, make loans upon first mortgages on immovable property which is the subject of agricultural cultivation or used for the purposes of such cultivation.

2. To create and negotiate bonds, the sums repayable on which may not exceed the amount of the debts due from the national companies to the International Company, and secured by first mortgages registered in the name of the national companies, belonging to them or held by them as security. Only societies or mortgage or agricultural credit institutions having their offices within the territory of Governments which are signatory to the Convention shall be empowered to receive loans.

The Company is formed with a capital of 250 million gold Swiss francs, (the gold franc being equivalent to 0.290322580640 grammes of fine gold), divided into shares of 2500 francs, of which 10,000 shall be A shares, registered, and 90,000 B shares, either registered or bearer shares. At general meetings the holders of A shares shall have one vote per share, and the holders of B shares one vote for every fifteen shares,

but A and B shares carry equal rights in the division of profits and generally in any distribution of the company's assets.

Of the authorised capital a first block of 25 millions of francs will be issued immediately, representing the 10,000 A shares. These shares will be offered for subscription in each of the countries whose Governments are parties to the Convention, in proportion to the amount which each Government has respectively undertaken to contribute towards the formation of a "special reserve" which is described below. In each country a preference will be given to subscriptions from mortgage or agricultural credit companies or institutions. In countries possessing legislation of a general character concerning the organisation of such companies or institutions, the preference will be given to such of these companies as have been authorised and constituted under the provisions of such legislation.

The capital of the International Company may be invested :

(1) As to not more than one-tenth, in the movable property and any immovable property to be used for the establishment of the registered office of the company or required for the working of its services ;

(2) As to not more than one-third, by credits opened or loans granted, such credits or loans to be secured by first mortgages and accorded in conformity with the requirements of the Statutes.

In order to guarantee the commitments undertaken by the International Company, there is in addition constituted a "special reserve" of 25 million gold Swiss francs (equivalent to 7,258,064.516 grammes of fine gold) by means of advances made by the contracting Governments, proportionate to the contributions made by them respectively to the budget of the League of Nations and repayable, as will be seen, before any other distribution of profits. This sum will figure as a separate account, entitled "Special Reserve Fund A formed with the advances of the Governments". As and when the repayments are effected, equivalent amounts will be transferred from this account to another, entitled "Special Reserve Fund B formed by the International Company".

The International Company will deposit with the Bank for International Settlements, or other banks of high standing, designated by the Board, a sum equal to the advances which have been made by the Governments. In case of need, all or part of the sum so deposited may be withdrawn for the purpose of enabling the International Company to meet its commitments, on condition always that the amount of the deposit shall as soon as possible be re-established and that until this is done no distribution of profits may be made. The interest earned by the said deposit shall be paid to the Governments in proportion to the amounts which they have advanced and which have not been repaid.

This special reserve fund constitutes an additional security for the holders of the bonds to be issued, a security which is regarded as essential for the success of the whole project. Experience in a number of countries has shown that the first years of a mortgage credit company are usually the most difficult. If on the other hand a company has succeeded in working over a number of years and has been able to build up a substantial reserve as a guarantee for the bonds issued by it, a steady development may in normal circumstances be expected, provided of course, that it is administered on sound business principles. The Government advances to the special reserve would have the effect of providing such a reserve at the outset and of assuring to the holders of the bonds an additional security, which it would otherwise take many years to establish. In addition, the fact of Governments supplying the necessary funds for this purpose is in itself likely to have a favourable effect on the financial markets and to inspire public confidence.

The Company is empowered to issue bonds, registered and bearer bonds, up to a total amount not exceeding ten times the total amount of the paid up capital and the special reserve. However, on the basis of the authorised capital (250 million gold Swiss francs) and as and when this is actually paid up, as also on the basis of the special reserve (25 million Swiss francs), the Bank will be enabled to increase the issue of bonds up to a maximum of 2,750,000,000 gold Swiss francs. Pending their final employment the sums derived from the issue of the bonds will remain on deposit with banks of the highest standing, or will be temporarily invested in short term securities of the highest character.

With the funds at its disposal the International Company will accord the national companies approved by the Board loans repayable by annual amortisation within not more than thirty years. The national companies, in their turn, must formally undertake to use the sums lent to them exclusively for loans secured by first mortgages on real property, whether built on or not, situated in the country in which the national company has its registered office and forming part of an agricultural undertaking or utilised for such an undertaking. Such loans may not exceed 50 per cent of the estimated value of the property offered as security.

The Board of the International Company fixes all the terms of the loans made by the Company to the national companies, including the rate of interest, and the annual amount and duration of the amortisation. The loans thus obtained will be represented by bonds—expressed in a currency having a parity with gold fixed by law — which will be issued by the national companies, and consigned in accordance with the conditions agreed upon, to the International Company.

The Company may require that the Governments of countries whose national companies desire to obtain loans through the Company take particular legislative measures for the purpose of rendering more effective the mortgage security. In some cases in consequence of some incompleteness in the legislation relating to mortgages or for some other reason, sufficient guarantees may not be forthcoming. The Company may then also require as a condition for the granting of a loan to a national company — when it considers that sufficient security is not enjoyed by mortgagees in the country where the national company operates — that the Government of that country shall guarantee the service of the bonds given by the national company in respect of the loans.

It is at the same time considered to be highly desirable that legislation relating to the mortgaging of property and to the foreclosure of existing mortgages should be perfected as rapidly as possible in all those countries in which it is at present defective, and accordingly there was annexed to the documents submitted to the Council a set of principles relating to this subject which it is hoped may be accepted as a basis of legislative reform in a number of European countries. It is rightly felt that the execution of these reforms would do much to facilitate the granting of credits to agriculturists and thus to lower the rate at which they can borrow. Speaking generally, the Company has always the right to refuse an application for a loan.

The Board will appoint representatives to examine and supervise the operations of the national companies; the companies must undertake to facilitate the exercise of their duties by these representatives. The Board may also require national companies which obtain loans from it to create within their organisation a special department for business transacted with the International Company, such section to have its own capital not subject to the claims of other creditors of the national company.

The maximum margin between the rate of interest at which a national company

borrow from the International Company and the rate at which the national company in its turn lends out the sums thus received will be determined by agreement between the national company and the International Company. Every effort, it is added, will be made to make loans to agriculturists at the lowest rates consistent with the essential object of the International Company.

As regards the special credit requirements of the countries of Central and Eastern Europe referred to under heading II of this article the Company is also empowered to make medium term loans to national companies with or without amortisation. The rules above indicated and the other rules contained in Chapter VI of the Statutes apply to these loans in so far as they are compatible with their nature.

The management of the International Company will be vested in a Board composed of 18 members: the President and Vice-President will be appointed by the Council of the League of Nations; two other members will be appointed, one by the Permanent Committee of the International Institute of Agriculture, and the other — selected for his special competence in finance — by the Bank for International Settlements. If these institutions renounce their right of appointment, these appointments will be made by the Council of the League of Nations. Nine members will be appointed, for the first term of office, by the Organisation Committee appointed by the Council of the League of Nations which is to take all steps required for the first issue of shares of the International Company, for its organisation and preparation for its operations. Subsequent appointments will be made by the general meeting; only one ballot will be held, each vote to which a shareholder is entitled may be given for one candidate only; the nine persons obtaining the greatest number of votes will be declared elected. These nine members of the Board must be chosen from among governors, vice-governors, presidents, vice-presidents or representatives of land, mortgage or agricultural credit companies or institutions, or from among persons having special knowledge and experience of banking and credit. The other five members of the Board will be appointed by an absolute majority of the directors already appointed in the manner indicated, the general interests of the Company being kept in view and in particular the necessity of encouraging the participation of the chief financial markets in the placing of the company's bonds.

The Board thus constituted will, it is believed, adequately represent the different interests concerned and the method of appointment will preclude the risk of the general control falling into the hands of particular interests.

The annual net profits — after making such appropriations and amortisations as have been decided by the Board, and after re-establishing, if necessary, the special reserve fund B, so as to prevent the sum total of the special reserve funds A and B from being inferior at any time to 25 million gold Swiss francs — will be distributed as follows:

(a) five per cent. of such net profits shall be paid to a reserve fund called the "legal reserve fund", until that fund reaches an amount equal in value to 10 per cent. of the capital issued;

(b) thereafter, such net profits shall be applied to the payment of a dividend of 6 per cent. per annum on the amount of the paid up capital of the International Company; this dividend shall be cumulative in the sense that the shareholder shall be entitled to payment of arrears of dividend before any other distribution of profits;

(c) from the residue, 75 per cent. shall be allocated to the Governments, that is to say, 70 per cent. shall be applied to repayment of the advances made by

them for the formation of the special reserve as described above, and 5 per cent be paid as bonus in respect of these advances.

After the advances of the Governments have been completely repaid, the said 75 per cent. of the profits shall be carried to the special reserve fund B or to optional reserves proposed by the Board and approved by the general meeting. The balance of 25 per cent. shall either be used for distribution to the shareholders of a supplementary non-cumulative dividend or paid into the reserves or carried forward. The supplementary non-cumulative dividend which may thus be distributed shall be limited to 4 per cent. until the advances of the Governments have been entirely repaid, and thereafter to 6 per cent.

The Board may decide that the portion of the profits available for a non-cumulative supplementary dividend shall be held over during the whole year and carried to a special dividend reserve fund for the purpose of assuring payment of the 6 per cent. cumulative dividend or for subsequent distribution as dividend among the shareholders.

It should be noted in conclusion that the Convention by which the new Bank is called into existence not only affirms its corporate character as based on the constitution and ensures to it the special financial assistance of the contracting States, but also provides that by special concession on the part of the Governments the International Company, its property and assets, and all remittances coming from or going to the territory of a contracting Government and resulting from transactions carried out by it in the normal course of its business, shall be exempt from any measure such as requisition, confiscation, prohibition or restriction of any kind: certain fiscal exemptions are also contemplated under the Convention, to be based on the four following principles:

(a) that the country in which the Company has its seat shall not derive any fiscal benefit from the fact of having been chosen as the seat;

(b) that necessary measures shall be taken in all countries in which the Company conducts its business to avoid double taxation which might result from the fact that its business is in fact transacted in several countries;

(c) that the essential object of the Company being to reduce, as far as possible, the rate of interest on loans to agriculturists, the countries in which those loans are effected should impose no fiscal charges either on the loans granted or on the service of those loans, it being left optional for the Governments to accept or not this principle;

(d) that the Governments may collect internal taxes, charges and duties on the persons residing in their territory and on the securities subscribed or circulating in their territory, subject, however to no obligation being placed on the company, except as regards stamp duties payable in cash on the issue of shares or bonds placed in the territory.

It is evident that the legal and fiscal privileges prescribed by the Convention and by the Constituent Charter will tend to facilitate to the utmost the whole working of the International Company. It is not too much to prophesy that the new Bank, in virtue of the special support of the contracting States, the privileges it enjoys and the system of guarantees and reserves that has been adopted, will be in a position to supply capital at a lower rate than that usually charged by the credit institutions of the participating countries.

G. COSTANZO.

FARM ECONOMICS

Problems of the Live Stock Industry in South and East Africa.

UNION OF SOUTH AFRICA.

General Position. — In semi-arid regions, the animal industry should be the major enterprise. This is a principle the truth of which has only lately begun to be recognised in respect of South Africa.

The tradition of the cattle farming industry in South Africa dating back much before the days of the Union has been towards the production of a hardy type suitable for the traction and transport purposes of the country, and able to use a natural pasturage of regions which are largely semi-arid in character. Even at present when mechanical traction for farm purposes has been introduced into almost all countries developed by Europeans, the draught or "trek" ox is still employed in many parts of South Africa, and it is maintained and probably justly that its use is more economic than that of the farm machine owing to the long distances which separate most farms from any town or repairing shop, and also to the uneven and stony nature of much of the land under cultivation.

Hence the typical cattle of the country were hardy, muscular, disease-resisting, but on the whole undersized and lean. Some herd improvement was effected by the Dutch East Indian Company by means or some crossing of the "Afrikander" with Holstein-Frieslands, etc., with the result that dairy breeds were developed. From 1870 onwards beef-breeds have also been imported, and in the building up of the beef-breeds in the ranching areas the hardiness and greater disease resistance of the indigenous cattle have proved of great value.

The introduction of improved breeds has not however been accompanied by adequate production or provision of the necessary supplementary feedstuffs in the form of forage crops or otherwise. Any provision that has been made tends to be absorbed by the dairy herds. In addition, the Union is greatly overstocked. The total head of cattle in the Union, according to the live stock census taken in 1929, amount to more than 10.5 millions. Of these about half are owned by native farmers, and while for the reason already given, *viz.*, poverty of the feeding, the quality of the beef cattle remains poor even among European owned stock, that of the native owned cattle is even worse. This is largely due to the fact that until quite lately it has not been customary for the African to regard his cattle as foodproducers or as possessing commercial value. They are kept, naturally, as draught animals, but primarily looked upon as a sign of social prestige and as a form of wealth used almost exclusively for the purchase of wives. So poor is the condition to which these native owned cattle may be reduced that it is quite common in the native reserves to find that the spring ploughing is deferred, long after the ground is ready, till the enfeebled cattle have regained their strength on the new grass.

Taking South Africa as a whole, it is an admitted fact that out of the ten and a half millions of cattle, a very large proportion are of no breed and are scarcely more than consumers of fodder. About two million are employed as draught oxen by European farmers; the number of dairy cattle of satisfactory type is difficult to estimate but may be about two and a half million. The remainder whether European owned or native owned are very largely maintained merely as the result of habit and tradition. Even if these immense numbers were in excellent beef condition,

they would be far in excess of the internal beef requirements of a country of which the total European population is only about two millions while the six million or so Africans chiefly subsist at present on maize meal and Kaffir corn.

Beef-cattle industry. — The natural solution of the difficulties of the Union stock farmer is the development of a beef export trade, and in fact a fairly flourishing export of beef to Europe was in existence during the years 1915 to 1921. This however dwindled owing to the inferior quality of the product and the increasing international competition. The present position is that live stock improvement by means of breeding, supplementary feeding and range or pasture management is the first essential, while, to quote the Report of the Secretary of Agriculture for 1930, "a general movement among farmers towards improvement cannot be expected unless there is a reasonable certainty of remunerative marketing". Hence the expansion of marketing facilities, including all possible provision of cold storage, must proceed simultaneously with the development of the industry. The keen interest taken by the Union Government in this matter was strikingly evidenced by the Government mission of enquiry sent to Argentina in 1928 for the express purposes of investigation of the methods pursued in the live stock industry and in the export trade. This was followed by the establishment of a separate Division of Animal Industry in the Department of Agriculture, while active propaganda as regards methods of animal feeding have been carried on recently by the Division of Agricultural Education and Extension (1). In addition mention should be made of a Cattle Improvement Bill introduced in the latter half of 1930, but postponed. The chief provisions were : sale of slaughter cattle on live weight basis ; proclamation of certain determined cattle improvement areas ; introduction of a levy to be used *inter alia* for the encouragement of export of beef and beef cattle. Although this measure did not obtain the required support, it indicates the general trend of Government policy. Public attention is undoubtedly being increasingly directed towards a solution of the problem in its double aspect, of live stock improvement and of development of markets, and some progress is being made in the direction of organisation of cattle owners for herd improvement by breeding and feeding. To quote a recent press opinion : "An organisation is required which would embrace all cattle owners and would be sub-divided into dairy and meat interests — in many respects inseparable — an organisation in which the various cattle breed societies would take an active and prominent part ; one which would narrow the gap between the prices received by the producers of meat (including dairy products) and those paid by the consumers, eliminating many redundant middlemen, and breaking 'rings' which interfere with the proper functioning of the law of supply and demand. Such an organisation would strive to 'scrap the scrub', and would institute a widespread system of selling by weight and grading" (2).

The Beef export trade. — Beef exports from the Union for the year ending 30 June 1930 amounted to a total of 115,089 cwt., about 150,000 cwt. being also exported through Union ports from Rhodesia and other adjoining territories. The total value of the Union exports of all kinds for this same year was a little under

(1) The part taken by the Land and Agricultural Bank of South Africa in promoting live stock improvement is also of importance. Grants are made both in money and in the form of pure bred stock to the co-operative live stock societies. Also as an outcome of measures for relief of drought distress, the formation of the so-called "Special Live Stock Societies" was encouraged. These consist of small groups of farmers in drought areas who receive grants in the form of ordinary live stock, including dairy cows. These grants have been found especially useful in the case of farmers who formerly confined themselves to maize farming and suffered heavy losses from drought.

(2) The *South African Farmers' Advocate* XXVIII, No. 1, Bloemfontein. September 1931.

£420,000, which represents an increase of £157,500 on the values of the previous year. The total of nearly £420,000 included a small export of live cattle to England, which attracted a good deal of attention. Opinions vary as to the possibility and advisability of developing this form of export. Even its advocates express themselves in somewhat guarded terms: " Provided animals of the desired age, weight and quality are assembled and provided the cost of raising them has been kept low by veld feeding until a month or so before shipment, when cheap maize could form a considerable proportion of the finishing ration, the prospects of developing a lucrative trade in export of live cattle at *certain periods* of the year are encouraging " (1).

On the other hand the course recommended by the Department of Agriculture is that of concentrating on chilled carcasses, and this view was recently voiced by the Acting Secretary for Agriculture at the Conference convened by the South African Agricultural Union in Bloemfontein in August 1931 to consider the meat industry and its problems. It is generally agreed that the first problem is the remunerative production of a commodity suitable for the overseas market, and the second the better organisation of marketing in the Union and overseas.

As regards improved feeding there is an increasing body of opinion in favour of utilising a much larger proportion than heretofore of the Union maize crop as stock feed, and the practice of utilising or selling maize for this purpose is becoming more general. The maintenance of the maize export, as being by far the most valuable of the crop product exports from the Union, has naturally been up to now regarded as of great importance to the national economy, but partly as the result of the low level of maize prices, partly from a growing recognition of the necessity of improved feeding, there is a noticeable change of outlook in this respect. The fact that many of the green forage crops are difficult to grow in the semi-arid conditions prevailing over large areas of South Africa adds to the importance of maize. Lucerne, the characteristic feed of the Argentine herds, for example, will only grow in South Africa under irrigation. Some success has lately attended the growing of ground nuts as a hay crop.

It is a significant commentary on the live stock position in the Union that with a total head of over ten and a half million cattle, it was found necessary to *import* during the year 1929-1930 for slaughter and consumption the equivalent of 28,677 head of cattle from the adjoining territories (being 11,000 less than the previous year), as well as 12,591 animals for breeding and restocking.

Dairy-farming. — For some years past increased interest has been taken in dairying, and it has come to be regarded by many Union farmers as a main source of income, instead of, as before, a merely subsidiary enterprise. It has been found that even in the areas of low and uncertain rainfall dairying is a valuable method of converting into cash values the roughage produced in the course of ordinary crop production. Satisfactory development is in progress in districts in Bechuanaland and the Northern Transvaal as well as in the better watered regions. A State milk recording and butter-fat testing scheme is in operation. Co-operative creameries and cheese factories are making steady progress — from 1929 to 1930 the number of dairy produce societies increased from 22 to 28 and their total membership from 2,930 to 3,168. There have also been large increases in production of factory and farm butter, and of factory cheese, as compared with 1928. These increases have been reflected in the exports. For the year ending 30 June 1930 the

(1) *The Farmers' Advocate*, loc. cit.

value of the butter and cheese exports was nearly £400,000, whereas in the previous year this value was only £ 66,000.

A further development of the industry is anticipated from the activities of the Dairy Industry Control Board set up by the Act passed in June 1930 under which the Board has power to impose levies on all butter and cheese manufactured in the Union, and to use the funds so raised to pay export bounties on butter and cheese and to take other measures for developing the dairy industry. The Board is representative of the industry, including distribution, the chairman alone being a Government official. A levy of 1d. in the lb. on butter, butter substitutes, and cheese has been already imposed, and bounties have been paid on exports over several months (1). The Board has powers of determining minimum exportable quantities by any factory, and of issuing regulations relating to export. It will be seen that as regards the levy the policy is modelled on that of the Australian Butter Stabilisation Scheme. The powers of determining minimum exportable quantities have given rise to considerable discussion and opposition on the part of the factories.

SOUTHERN RHODESIA.

General Position of Live Stock Industry. — The geographical and physical conditions of the high tableland which constitutes the most of Southern Rhodesia are very similar to those of the adjacent territories of the Union, and a close resemblance is found in the problems relating to live stock improvement and the building up of a beef export trade.

Out of 2.5 million head of cattle, the numbers owned by Europeans are reported as somewhat over 900,000. For the last ten years little improvement has taken place in the quality of beef cattle. With a European population much smaller and even sparser than in the Union, the internal demand for beef is small, and the development of an export trade has been attended by difficulties, partly owing to the great distances from the ports either of the Union or of Portuguese East Africa (2). The best quality slaughter cattle are sent to Johannesburg for the supply of the mining districts of the Transvaal. During 1930 a new market has been opened up on the copper fields of Northern Rhodesia, and for some time past considerable exports of chilled and frozen meat and meat products, as well as slaughter cattle, have been railed to the Belgian Congo. Shipments of live cattle to Great Britain through Durban are increasing and have now been taken over by the Department of Agriculture. There has also been a considerable export of dressed beef shipped through Durban to the Italian market for the Italian army. A serious set back however to the export of meat from Rhodesia has lately come about owing to the outbreak of foot-and-mouth disease in Southern Rhodesia near the Transvaal border; it is however anticipated that this check will only be temporary. The need for live stock improvement in Rhodesia is illustrated

(1) It will be noted that whereas provision has thus been made in the case of the dairy products trade for subsidising the exports, the Government has so far refused to contemplate such a policy in regard to the beef export trade, on the ground that the principle of levies and subsidies is not sound and that such measures can only be palliative.

(2) According to the recently published Report of the United Kingdom Trade Mission to the Union of South Africa, Southern Rhodesia and Northern Rhodesia, it is the general opinion of cattle farmers in Southern Rhodesia that direct railway communication with Walvis Bay, which would permit the shipment of chilled meat to the English market by the shortest sea route from South Africa, would enable them to expand their business rapidly and profitably.

by the fact that out of a total export for 1930 equivalent to 60,871 cattle (a total less by 13,000 than in the previous year), the better grades of beef were represented in the proportion of only 12.7 per cent. Prices on the whole have been satisfactory.

As regards Government measures for encouragement of the industry, a system of short term loans for purchase of pure bred stocks has been in operation for some time in conjunction with other loans for farm development and assistance in farming operations. With the object of encouraging the beef export trade which is considered to be of special importance to Southern Rhodesia, bounties were paid in 1930 both on the export of dressed beef and on that of live animals. In April 1931 legislation was introduced for the imposition of a levy to be made on all cattle slaughtered for sale or consumption, in excess of five head per annum, and one in respect of all cattle exported from Rhodesia (but not sent overseas), whether as live animals or as chilled or frozen meat. It is intended that the proceeds of these levies, which must not exceed 2s. 6d. per head, should be administered by a Board consisting of representative cattle owners together with a nominee of the Government, and that they should be utilised for payment of subsidies on meat or live cattle exports, administrative and other expenses as directed by the Board. The outbreak of foot-and-mouth disease already referred to has had the effect of postponing the operation of the levy. It will be noted however that the Rhodesian Government accepts the principle of meat levies and subsidies, while the Union Government refuses to contemplate any such measures in respect of the meat trade.

There is a small export of butter and cheese from Southern Rhodesia mainly to adjoining territories. Dairying is mainly subsidiary to general farming. On the other hand the country can undoubtedly produce prime cattle and a valuable trade should ultimately result.

NORTHERN RHODESIA.

This large territory, nearly 300,000 square miles, is still only very partially developed. In consequence however of recent mining developments in the Western area, and the rapid increase in the European population (1), considerable encouragement is being given to agricultural settlement. The Government has engaged the services of an agronomist to report on the whole question of land and agricultural improvement in this area, which is well suited for stock farming. Considerable progress has already been made in dairying. State loans are being made for the importation of live stock and for the equipment of creameries and dairy improvement generally. The main difficulty in the way of live stock farming in Northern Rhodesia is the presence of the tse-tse fly. Measures are being taken for control of this pest with success.

In the north-eastern area of the territory, cultivation is mainly of tropical crops, in particular tobacco and cotton, and the region is not suited for live stock farming.

KENYA.

Among the British Dependencies of Central and Eastern Africa, Kenya appears to be so far the only one that includes areas really suitable for livestock farming. The highlands of southwest Kenya have abundant precipitation in most

(1) The European population of Northern Rhodesia has increased from 4,600 in 1925 to over 10,000 in 1930, and continues to increase rapidly.

seasons, although severe droughts occur from time to time, and there is as a rule excellent pasturage. The native tribes were and are in consequence a pastoral people, and in the areas of this region alienated to Europeans live stock farming and dairying is carried on with a fair degree of some success.

The recent live stock census taken in February 1931 gave the number of cattle as 236,895 head as compared with 226,861 in 1930, and 216,589 in 1925. These figures however relate only to cattle in the possession of European farmers, and show a satisfactory, if somewhat slow, progress in the industry. The real problem is that of the improvement in the live stock found on the native reserves. The native owned cattle are often of so poor a quality that it is stated that many are scarcely larger than large dogs, but their numbers are so immense as to be a serious menace to the food supply of the people and even to the maintenance of the soil. The Agricultural Commission held for the Colony and Protectorate of Kenya in October 1929 reported that "in many areas the vegetation is being eaten right down to the roots, the surface of the soil becomes broken and with the rainy season erosion sets in". The Report adds in reference to the Kamba Reserve in particular "over large stretches of hillsides vegetation has been almost wholly removed. The soil has been eroded down to the subsoil, and its removal will continue at an ever increasing rate. On less steep slopes and on better land, vegetation still persists, but even here the grazing has been so persistent that the ground is all beaten down into little stock-paths, and has become in its turn open to erosion". It should be added that part of this destruction is due to goats as well as to cattle. The same evil exists in other areas.

The psychological reason for this persistence in overstocking is the same among the Kenya tribes as that which has only less disastrous results in the native reserves of the Union, viz., that cattle are regarded as currency, and their possession as a sign of social prestige. The hides only are regular articles of trade. The measures proposed by the Agricultural Commission included the extreme one of compulsory reduction of live stock, in the case of the Kamba Reserve even down to one third of the present number, so as to ensure the continued existence of the tribe itself. An essential preliminary is the establishment of a meat factory, in a suitable position, to take over the stock to be culled. At first little saleable meat could be obtained and a working loss would probably be inevitable for a time, although hides and other products would be marketable. The ultimate solution, in the opinion of the Commission is the education of the native to eat meat, if only a few ounces per week, their present diet being much deficient in protein. Meantime the compulsory closing of certain blocks for a term of years, to permit of regeneration of the vegetation, is proposed and a further proposal is for the establishment of an educational stock farm, with facilities for instruction of Africans in simple improved methods.

The root difficulty lies in the plain fact that the native would rather keep his stock, as visible evidence of wealth, than have the money he could obtain for it. An ingenious suggestion for meeting the native psychology in this respect is that a special coinage might be prepared to be used in payment of stock forcibly expropriated, such coins to be large, made of bronze of a resistant type, and stamped with the image of a bull and nominal value, say 30s. (or that of a goat and 10s.). These coins would be legal tender within the Reserve, and exchangeable at any banks for their face value in ordinary currency. So that they might, if preferred, be worn for purposes of display, they should be perforated.

For Kenya, in short, as regards native agriculture it is essential to educate the native to treat his live stock as a means of producing food for himself and others,

and with that object to further in every way the work of the agricultural officers, who work in the Native Reserves. As regards European farming, it is the opinion of the Commission that mixed farming is the essential basis for the agriculture of the Colony, and the development of stock farming in conjunction with cultivation of field crops is to be encouraged in all suitable areas. It may be added that an interesting experiment in co-operation in dairying between African and European producers is being carried out in one district, and may lead to further enterprises of a similar kind.

CONCLUSION

It will be noted that the territories under review amount in all to nearly 1.5 million square miles. Out of this, deducting the areas unsuitable for live stock farming, there still remains, as has been seen, a very large proportion, probably about one million square miles, on which meat could be profitably produced and is at present not so produced, owing very largely to overstocking with inferior animals.

In addition, not only in Kenya as described, but also, if to a less extent in the Union of South Africa and in Southern Rhodesia, this overstocking tends to bring about destruction or impoverishment of natural vegetation, and the further menace of soil erosion. It is difficult to over-estimate in semi-arid regions the losses due to the diminution of natural resources due to erosion. There can be no question that the main agent in erosion in such regions is poor range management or the absence of such management.

C. H.

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(1) Previous list June 1931. To be continued March 1932.

(2) List of abbreviations: bihebd. (biweekly); bimens. (twice monthly); bimestr. (bimonthly); étr.. (Subscription for foreign countries); hebd. (weekly); sem. (half yearly); S. (series); trim. (quarterly); v. (volume).

(3) Between brackets [] are given translations and explanatory notes not appearing in the title of the review.

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AGRICULTURAL STATISTICS

MONTHLY CROP REPORT

AND AGRICULTURAL STATISTICS

The following notes refer to crop conditions quoted in the crop reports and in the tables. — Crop condition according to the system of the country: Germany, Austria, Hungary, Luxemburg and Czechoslovakia: 1 = excellent, 2 = good, 3 = average, 4 = bad, 5 = very bad; France: 100 = excellent, 70 = good, 60 = fairly good, 50 = average, 30 = bad; Lithuania, Poland, Sweden and Switzerland: 5 = excellent, 4 = good, 3 = average, 2 = bad, 1 = very bad; Netherlands: 90 = excellent, 70 = good, 60 = fairly good, 50 = below average; U. S. S. R.: 5 = good, 4 = above the average, 3 = average, 2 = below average, 1 = bad; United States: 100 = crop condition which promises a normal yield. — For other countries the system of the Institute is employed: 100 = crop condition which promises a yield equal to the average of the last ten years.

CEREALS

World cereal crop prospects.

European weather in June has not been uniform and vegetative development of the crops has varied considerably; in some countries crop condition has improved, in others it has worsened. In the more northern zone there was a general predominance of cold and often rainy days, and only toward the end of the month was there a return of fine weather and the insolation and temperature necessary for growth. Under these weather conditions development in the British Isles and in the Baltic and Scandinavian countries had been somewhat arrested by the beginning of July and the situation was on the whole less satisfactory than at the beginning of June. In the middle zone (France, Germany, Poland, Czechoslovakia, etc.) the prevalently fine weather with moderate temperatures and insolation was interrupted by brief spells of rain. This weather was in general very favourable to growth and to the first phase of ripening of the ears and notably improved the crop condition, which at the beginning of July promised a better harvest than a month previously. In the southernmost zone on the other hand, drought, accompanied by a marked rise in temperatures, continuous insolation and several spells of scirocco, prevailed. In the lands between the Iberian Peninsula and the Black Sea there was in consequence often a hastened and sometimes a precipitate ripening of the ears, causing a notable reduction in yields, especially in Italy, Spain, Hungary and part of Rumania. Exceptions are Bulgaria and Yugoslavia, which had good precipitation in the first half of June, and Greece, where there were frequent and excessive rains. Crop prospects in these three countries remain good and in Yugoslavia are even excellent.

The data on the cereal crops expected in Europe, published in separate table, are still very incomplete, covering less than half the total production of Europe (excluding the U. S. S. R.). The totals, which indicate for almost all cereals reduced production as compared with last year, cannot be considered as representative of the course of production in Europe as a whole, since the prospects in the countries for which there are still no figures available are such as to compensate for the decrease shown in comparison with 1930 and even considerably to exceed it, as in the case of wheat.

For wheat, a detailed examination of the prospects of production throughout Europe at the beginning of July leads to the opinion that, if no further damage occurs in

the final period of ripening and during the harvest, the crop in Europe (excluding the U. S. S. R.) may be round about 840/850 million centals (1,400/1,420 million bushels), exceeding, therefore, the 820 million centals (1,370 million bushels) obtained last year by about 20/30 million centals (30/50 million bushels). For rye and barley, on the contrary, a crop smaller, though not very much so, than that of 1930, seems probable, and for oats a somewhat more abundant crop.

With regard to the U. S. S. R., the area sown to wheat is estimated at about 93 million acres, showing an increase of nearly 7 million acres compared with last year and of 20 million acres compared with the average of 1925-1929. The Government's plan already anticipates, for next autumn, a further increase of winter sowings from 30 to 37 million acres. The development taking place in wheat growing in the U. S. S. R. is a phenomenon which must be considered very attentively because it is occurring even during a period of disequilibrium between supplies and requirements and of price crises, and also because it will permit the concentration under the sole direction of the State monopoly, of the large quantities of wheat for export, the relative importance of which seems destined to grow in proportion not only to the greater supplies of the U. S. S. R., but also to the smaller surpluses of the other exporting countries where growing of the crop is in regression. Russian wheat production in 1930, according to the official data, was 650 million centals (1,080 million bushels) with a yield of 12.7 bushels per acre which seems to be the highest obtained in recent years. Yields per acre from 1925 to 1929 in order of time were as follows: 12.4 — 12.4 — 9.8 — 11.0 — 9.8 bushels; average for the five year period: 11.0 bushels. The situation of crops on July 1, was considered to vary from average to above the average for winter wheat which covers about 30 million acres, and average or below the average for spring wheat, on an area of 53 million acres. This situation indicates that, unless very serious damage to spring wheat occurs during the periods of flowering and ripening, the U. S. S. R. will have at its disposal for the foreign market in the season 1931-32, quantities of the new crop of great importance considered in conjunction with the good prospect for the rye crop, which occupies an area not much smaller than that under wheat.

In North America it has now been ascertained that Canada will have a poor crop as the rains have fallen too late to save a large part of the crops affected by the long drought. On the basis of crop condition on July 1, the forecast of production is 140 million centals (230 million bushels); even admitting the possibility of a slight increase in the estimate if there is a continuance of the good weather conditions which prevailed in the first half of July, the exportable supplies from the new Canadian crop will only with difficulty exceed 60 million centals (90 million bushels) compared with 160 million centals (260 million bushels) last season. Production in the United States on the basis of crop condition on July 1, is estimated at a total of 520 million centals (870 million bushels) of winter and spring wheat, showing a slight increase over the 1930 crop. Weather during the first half of July was not very favourable and damage has been reported due to the excessive heat. The exportable surplus of the new production may be forecasted, on the basis of indications at present available, to nearly equal that of last year, that is, about 90 million centals (150 million bushels). Production of other cereals is forecasted to be, on the whole, satisfactory.

In North Africa crops appear to be generally good, especially in Tunis and Egypt.

The producing countries of Asia announce a crop, on the whole, a little smaller than that of 1930 but above the average.

On the basis of the crop situation on July 1, the total production of the northern hemisphere appears to be somewhat smaller than that of last year, at least for wheat and oats, but should not differ greatly from that obtained in a good average year. Rather large diminutions seem to be probable, on the contrary, for rye and barley.

Cereals production.

COUNTRY	ENGLISH WEIGHTS			AMERICAN WEIGHTS			% 1931	
	1931	1930	Average 1925 to 1929	1931	1930	Average 1925 to 1929	1930 = 100	Average = 100
	Thousand centals			Thousand bushels			%	%
WHEAT								
Germany	100,840	82,531	71,859	168,063	139,216	119,763	120.7	140.3
Belgium	(w) 9,034	(w) 9,538	(w) 8,718	15,056	15,897	14,530	94.7	103.6
Bulgaria	34,238	34,964	24,285	57,062	58,272	40,474	97.9	141.0
Spain	87,205	87,506	87,379	145,339	145,991	145,628	99.6	99.8
Finland	626	726	601	1,043	1,210	1,002	86.2	104.1
Hungary	30,348	50,604	47,726	65,579	84,338	79,542	77.8	82.4
Malta	166	182	175	277	303	292	91.6	94.9
Netherlands	4,788	2,983	3,623	7,981	4,871	6,037	160.5	132.2
Rumania	67,453	78,464	63,319	112,419	130,770	105,530	86.0	106.5
Totals	343,698	348,588	307,685	572,819	530,968	512,798	98.6	111.7
Canada	(2) 139,100	238,723	258,428	(2) 231,833	397,872	430,704	58.3	53.8
United States	(w) 427,567	367,200	328,463	712,611	612,000	547,427	116.4	130.2
Mexico	(s) 9,099	150,600	161,816	156,402	251,000	274,687	62.3	56.9
Totals	669,607	763,391	758,163	1,176,011	1,273,318	1,263,578	87.7	88.3
India	206,662	229,981	191,341	344,437	383,301	318,901	89.9	108.0
Japan	17,712	17,723	17,817	29,519	29,538	29,095	99.9	99.4
Totals	224,374	247,704	209,158	373,956	412,839	348,596	90.6	107.3
Algeria	17,858	19,350	17,790	29,762	32,249	29,649	92.3	100.4
French Morocco . .	21,083	17,782	16,963	35,137	21,302	23,280	164.9	124.2
Tunis	8,378	6,239	6,878	13,962	10,398	11,464	134.3	121.8
Totals	47,319	38,371	41,636	78,861	63,949	69,393	123.3	113.6
General totals . . .	1,284,998	1,398,054	1,316,642	2,141,647	2,330,074	2,194,365	91.9	97.6
RYE								
Germany	161,379	169,207	167,462	288,177	302,317	299,040	95.8	96.4
Belgium	11,835	10,433	12,206	21,135	18,630	21,797	113.4	97.0
Bulgaria	7,218	7,577	4,104	12,889	13,530	7,329	95.3	175.9
Spain	12,509	11,580	13,132	22,338	20,679	23,450	108.0	95.3
Finland	7,324	7,898	7,013	13,079	14,104	12,522	92.7	104.4
Hungary	12,791	15,907	16,836	22,342	23,406	30,064	80.4	76.0
Netherlands	7,203	6,936	8,866	12,862	12,383	15,832	103.8	81.2
Rumania	8,472	10,241	5,971	15,129	18,288	10,662	82.7	141.9
Totals	228,731	239,869	235,590	408,451	423,337	420,696	95.4	97.1
Canada	(2) 4,750	12,380	7,245	(2) 8,483	22,018	12,937	98.5	65.6
United States	21,448	26,936	25,832	38,300	48,100	46,129	79.6	83.0
Totals	26,198	39,316	33,077	46,783	70,118	59,066	66.7	79.2
General totals . . .	254,929	279,135	268,667	455,234	498,455	479,762	91.3	94.9

Cereals production.

COUNTRY	ENGLISH WEIGHTS			AMERICAN WEIGHTS			% 1931	
	1931	1930	Average 1925 to 1929	1931	1930	Average 1925 to 1929	1930 = 100	Average = 100
	Thousand centals			Thousand bushels			%	%
BARLEY								
Germany	70,548	63,058	63,172	146,978	131,373	131,611	111.9	111.7
Belgium	1,630	1,836	1,894	3,396	3,825	3,947	88.8	86.1
Bulgaria	8,730	9,074	5,858	18,207	18,905	12,204	96.3	149.2
Spain	43,128	48,525	44,892	89,851	101,096	93,527	88.0	96.1
Finland	2,907	2,987	3,086	6,182	6,222	6,429	99.3	96.2
Hungary	10,210	13,250	13,118	21,270	27,605	27,330	77.1	77.8
Malta (1)	137	142	138	285	295	288	96.8	99.0
Netherlands	1,880	1,609	1,916	3,936	3,477	3,992	113.2	98.6
Rumania	37,611	52,270	36,233	78,358	108,916	75,487	71.9	103.8
Totals	176,859	192,320	170,307	368,463	401,715	354,815	91.7	103.8
Canada (2)	37,221	94,877	50,183	77,543	135,160	104,550	57.4	74.2
United States	128,160	160,800	127,201	267,000	335,000	245,006	79.7	100.8
Totals	165,381	225,677	177,384	344,543	470,160	350,556	73.3	93.2
Japan	35,218	34,786	40,696	73,372	72,472	84,785	101.2	86.5
Totals	35,218	34,786	40,696	73,372	72,472	84,785	101.2	86.5
Algeria	14,881	18,058	16,661	31,003	37,622	34,712	82.4	89.3
French Morocco	24,284	17,995	22,499	50,593	37,491	46,874	134.0	107.9
Tunis	3,968	2,646	4,217	8,268	5,512	8,787	150.0	94.1
Totals	43,133	38,699	43,377	89,864	80,625	90,373	111.5	99.4
General totals	420,591	491,982	431,764	876,342	1,024,912	899,529	85.5	97.4
OATS								
Germany	144,006	124,702	143,893	450,017	389,690	410,694	115.5	109.1
Bulgaria	2,998	3,187	2,332	9,370	9,901	7,287	94.1	128.6
Spain	14,056	16,354	12,860	43,924	62,070	40,188	88.4	109.3
Finland	12,909	13,267	12,933	40,342	41,458	40,415	97.8	99.8
Hungary	3,684	5,760	8,235	11,512	17,909	26,734	64.0	44.7
Netherlands	7,011	5,545	7,332	21,908	17,327	22,913	128.4	95.6
Rumania	19,383	25,497	22,518	60,510	70,070	70,368	76.9	86.0
Totals	204,027	194,312	210,103	637,583	608,784	668,569	104.7	97.1
Canada (2)	104,351	143,870	133,808	326,097	449,595	416,583	72.5	78.3
United States	418,005	484,560	421,428	1,806,287	1,958,000	1,316,953	96.2	99.2
Totals	522,356	578,430	554,736	1,632,384	1,807,595	1,733,536	90.3	94.2
Algeria	3,433	5,296	4,118	10,885	16,548	12,899	65.8	84.6
French Morocco	818	754	578	2,549	2,857	1,792	108.1	142.3
Tunis	1,036	661	772	5,238	2,067	2,411	156.7	134.8
Totals	5,335	6,711	5,463	16,672	20,972	17,072	79.5	97.7
General totals	731,718	779,953	770,302	2,286,619	2,437,351	2,407,177	93.8	95.0

w) Winter wheat. — s) Spring wheat. — (x) Including meslin. — (2) Figures calculated on the basis of area and crop condition on July 1.

With reference to the countries of the southern hemisphere, where it seems that the wheat areas have been the most reduced, the weather during June was not very favourable to sowing or to germination, being too dry in Argentina and too wet in several zones of Australia.

A summary in judgement of the prospects for world production this year can only be formulated on provisional lines and subject to great reserve at the present moment when the results of many crops in the northern hemisphere still remain partly dependent on the course of the season until the time of harvest and in the southern sowing has only just been finished.

In any case, information based on the situation at the beginning of July, seems to indicate that world wheat production in 1931 will probably be insufficient to fully meet the normal requirements of consumption and that therefore, during the coming commercial season (1 August 1931-31 July 1932), the heavy stocks of the previous crop with which the season is about to open, will be somewhat lightened.

G. C.

* * *

Germany : Weather in June was generally favourable to the growth of cereals. Occasional damage was caused however, by excessive rain and hail. Crop condition of winter cereals is mostly satisfactory. Flowering took place rapidly. If no laying of winter cereals occurs, a satisfactory crop of these might be forecasted. At the beginning of July cutting of winter barley began. Spring cereals were favoured by the weather and grew well. Here and there the effects of delayed sowing were felt: straw and ear are backward in growth. On July 1, crop condition of winter spelt was 2.6, against 2.7 on June 1 of this year and 2.3 on July 1, 1930.

Austria : At the beginning of June the anxiously awaited rains fell. In the first half of the month the weather was very hot. There were sporadic rains of thunderstorm type, accompanied, especially in Middle Styria, by hail. The wind dried up the little soil moisture that was present so that at the end of June drought was here and there felt. Winter cereals have particularly felt the lack of moisture. The grain is, however, for the most part satisfactorily developed. Production of straw, on the other hand, will certainly be poor. Spring cereals are also generally satisfactory. Oats have for the greater part suffered from drought.

Belgium : At the beginning of June the weather was cold and rainy. Toward the second decade dry conditions returned with warm sunny days and nights generally cool. On the whole the month was favourable for agriculture. Vegetation is well developed. Winter cereals are rather thin. Cutting of early winter barley has begun. Oats are somewhat irregular; in many districts weeds have been extremely abundant and its efficacious destruction has not been everywhere practicable owing to the repeated rains at the times most suitable for treatment of the crop. In general, however, the oat crop is very good.

Production of spelt in 1931 is estimated at 1,264,000 centals against 580,000 in 1930 and 735,000 on the average of 1925-1929, the percentages with respect to the latter figures being 217.8 and 171.8. The figures for mixed grain are respectively 177,000 centals (305,000 bushels), 106,000 (183,000) and 199,000 (344,000), and the percentages 167.3 and 88.9. Condition on 1 July of these two crops was reckoned as average against excellent at the same time last year.

Area and Crop Condition.

COUNTRIES	AREA SOWN					CROP CONDITION (†)											
	1930 31	1929 30	Average 1924-25 to 1928-29	% 1930-31		I-VII-1931			I-VI-1931			I-VII-1930					
				1929-30 = 100	Aver = 100	a)	b)	c)	a)	b)	c)	a)	b)	c)			
															Thousand acres		
WHEAT																	
Germany. . . { w)	4,638	3,997	3,705	116.1	125.2	2.6	—	—	2.7	—	—	2.4	—	—			
{ s)	697	405	370	172.1	188.2	2.7	—	—	2.6	—	—	2.7	—	—			
*Austria. . . { w)	...	486	475	...	...	2.6	—	—	2.7	—	—	2.2	—	—	
{ s)	...	22	29	...	...	2.7	—	—	2.5	—	—	2.5	—	—	
Belgium. . . { w)	389	412	388	94.5	100.3	—	f)	—	—	f)	—	d)	—	—			
Bulgaria. . . { w)	2,869	2,958	2,662	97.0	107.8	145	—	—	145	—	—	145	—	—			
*Denmark. . . { w)	...	249	247	...	...	—	—	(1) 98	—	—	—	101	—	—	
Spain. . . { w)	10,872	10,531	10,743	103.2	101.2	—	—	—	—	—	—	—	—	—			
*Estonia. . . { w)	...	90	66	...	...	—	—	(2) 99	—	—	—	122	—	—	
Finland. . . { w)	47	51	43	92.7	110.0	—	f)	—	—	—	—	f)	—	—			
France. . . { w)	12,494	12,900	13,128	96.2	95.2	—	—	—	—	—	—	—	—	—			
*Scotland. . . { w)	...	54	56	...	...	—	100	—	—	—	95	—	100	—	
Hungary. . . { w)	4,124	4,187	3,821	98.5	107.9	—	—	—	2.9	—	—	—	—	—			
Italy. . . { w)	12,029	11,896	12,156	101.1	99.0	—	—	—	—	—	—	—	—	—			
*Latvia. . . { w)	...	179	139	...	...	—	—	80	—	—	90	140	—	—	
Lithuania. . . { w)	410	362	225	113.3	182.5	3.1	—	—	—	3.0	—	4.0	—	—			
Luxemburg. . . { w)	25	25	30	100.0	83.8	2.9	—	—	—	—	3.2	1.9	—	—			
Malta. . . { w)	10	9	9	104.8	105.8	—	—	—	—	—	—	—	—	—			
Netherlands. . . { w)	191	142	135	134.4	141.1	—	—	(2) 69	—	(2) 70	—	(2) 82	—	—			
Poland. . . { w)	3,844	3,714	3,099	103.5	124.1	3.6	—	—	3.4	—	—	3.0	—	—			
Rumania. . . { w)	6,342	6,873	7,054	92.3	89.9	d)	—	—	d)	—	—	—	—	—			
{ s)	686	679	692	101.1	99.2	—	f)	—	e)	—	—	—	—	—			
*Sweden. . . { w)	...	646	488	...	...	—	—	—	—	—	2.7	3.7	—	—	
*Switzerland (3). . . { w)	...	182	171	...	...	—	100	—	—	—	97	—	100	—	
Czechoslovakia. . . { w)	1,904	1,919	1,769	99.2	107.6	—	—	3.0	—	—	—	2.3	—	—			
{ s)	74	64	99	115.5	74.8	2.9	—	—	2.6	—	—	2.9	—	—			
Yugoslavia. . . { w)	5,239	5,233	4,545	100.1	115.3	d)	—	—	e)	—	—	e)	—	—			
Total Europe. . . { w)	66,884	66,447	64,673	100.7	103.4	—	—	—	—	—	—	—	—	—			
U. S. S. R. . . { w)	29,653	27,182	21,021	109.1	141.1	—	—	—	—	—	—	—	—	—			
{ s)	62,901	58,612	51,698	107.3	121.7	—	—	—	—	—	—	—	—	—			
Canada (4). . . { w)	820	815	825	100.6	99.3	—	—	—	—	58	—	81	—	91			
{ s)	22,152	24,083	22,279	92.0	99.4	—	—	—	—	—	—	—	—	—			
United Sta- . . { w)	40,692	39,514	36,467	103.0	111.6	82.3	—	—	84.3	—	—	—	—	73.8			
tes (4). . . { w)	10,977	21,006	20,984	80.8	80.9	—	—	—	57.9	—	—	67.9	81.1	—			
Mexico. . . { w)	1,856	1,216	1,261	111.5	107.6	—	—	—	—	—	—	—	—	—			
Total America. . . { w)	81,997	86,634	81,826	94.6	100.2	—	—	—	—	—	—	—	—	—			
India. . . { w)	31,952	31,333	31,404	102.0	101.7	—	—	—	—	—	—	—	—	—			
Japan. . . { w)	1,220	1,198	1,174	101.9	104.0	—	—	—	—	—	f) k)	—	—	—			
Syria and Lebanon. . . { w)	1,168	1,175	1,147	99.4	101.8	—	—	—	—	—	—	—	—	—			
Total Asia. . . { w)	34,340	33,708	33,725	101.9	101.8	—	—	—	—	—	—	—	—	—			
Algeria. . . { w)	3,529	3,980	3,654	88.7	96.6	—	—	80	—	—	75	—	100	—			
Cyrenaica. . . { w)	18	38	33	46.2	53.2	—	—	—	—	100	—	—	—	—			
*Egypt. . . { w)	...	1,577	1,554	...	...	107	—	—	105	—	—	102	—	—	
Fr. Morocco. . . { w)	2,719	2,957	2,632	91.9	103.3	—	—	—	e)	—	—	f)	—	—			
*Tripolitania. . . { w)	17	12	—	140.0	—	—	—	—	—	—	—	—	—	—			
Tunis. . . { w)	1,903	(s) 1,730	1,719	110.0	110.7	—	—	—	120	—	—	—	—	—			
Total Africa. . . { w)	8,169	8,705	8,038	93.8	101.6	—	—	—	—	—	—	—	—	—			
Grand Totals. . . { w)	191,390	195,492	188,252	97.9	101.7	—	—	—	—	—	—	—	—	—			
{ n)	283,344	281,286	260,971	100.9	108.8	—	—	—	—	—	—	—	—	—			
RYE																	
Germany. . . { w)	10,591	11,463	11,416	92.4	92.8	2.9	—	—	2.9	—	—	2.6	—	—			
{ s)	183	179	209	102.1	87.5	2.9	—	—	2.8	—	—	—	3.0	—			
*Austria. . . { w)	...	886	892	...	...	2.7	—	—	2.8	—	—	2.3	—	—	
{ s)	...	41	54	...	...	2.7	—	—	2.6	—	—	2.5	—	—	
Belgium. . . { w)	558	574	568	96.3	97.3	—	f)	—	—	f)	—	d)	—	—			
*Bulgaria. . . { w)	622	648	481	96.0	129.5	145	—	—	145	—	—	140	—	—			
*Denmark. . . { w)	...	869	448	...	...	—	—	(1) 96	—	—	—	101	—	—	
Spain. . . { w)	1,544	1,446	1,637	106.7	91.5	—	—	—	—	—	—	—	—	—			
*Estonia. . . { w)	...	367	354	...	...	—	—	(2) 94	—	—	—	128	—	—	
Finland. . . { w)	554	556	565	99.6	98.0	—	f)	—	—	—	—	e) f)	—	—			
France. . . { w)	1,745	1,908	1,970	91.5	88.6	—	—	—	—	—	—	—	—	—			
Hungary. . . { w)	1,536	1,611	1,649	95.3	93.2	—	—	—	—	—	—	—	—	—			
*Latvia. . . { w)	...	680	627	...	...	—	—	60	—	—	—	75	—	—	
Lithuania. . . { w)	(w) 1,136	(w) 974	1,192	116.6	—	—	—	—	—	—	—	—	8.9	—			
Luxemburg. . . { w)	22	22	17	100.0	180.9	2.5	—	—	2.9	—	—	2.6	1.9	—			

COUNTRIES	AREA SOWN					CROP CONDITION (†)								
	1929-30	1928-29	Average 1923-24 to 1927-28	% 1929-30		I-VII-1931			I-VI-1931			I-VII-1930		
				1928-29	Aver. = 100	a)	b)	c)	a)	b)	c)	a)	b)	c)
OATS														
Germany	8,288	8,499	8,645	97.5	95.9	2.7	—	—	2.7	—	—	—	3.0	—
* Austria . . . . .	...	772	757	...	...	—	3.0	—	2.7	—	—	—	2.8	—
* Belgium . . . . .	...	674	678	...	...	—	f)	—	—	f)	—	—	d)	—
Bulgaria	326	340	338	96.0	96.6	140	—	—	140	—	—	160	—	—
* Denmark . . . . .	...	958	1,028	...	...	—	—	(1) 98	—	—	—	101	—	—
Spain	1,693	1,840	1,875	92.1	90.3	—	—	—	—	—	—	—	—	—
Finland	1,149	1,137	1,110	101.1	103.5	—	f)	—	—	—	—	c)	—	—
France	8,632	8,583	8,623	100.6	101.1	—	—	—	—	—	—	—	—	—
* Scotland . . . . .	...	862	906	...	...	—	—	95	—	100	—	—	100	—
Hungary	612	608	687	100.7	89.1	—	—	3.9	2.9	—	—	2.9	—	—
* Lithuania . . . . .	...	855	828	...	...	—	3.6	—	3.5	—	—	3.1	—	—
Luxemburg	70	70	72	100.0	97.6	—	2.8	—	2.2	—	—	2.0	—	—
Netherlands	366	370	377	99.0	97.1	(2) 71	—	—	(2) 71	—	—	(2) 68	—	—
* Poland . . . . .	...	5,404	5,007	...	...	3.1	—	—	3.3	—	—	—	—	2.5
Rumania	2,230	2,686	2,806	83.0	79.5	e)	—	—	e)	—	—	—	—	—
* Switzerland . . . . .	...	48	50	...	...	—	—	96	—	—	97	—	—	97
Czechoslovakia	2,116	2,066	2,078	102.9	101.9	—	—	3.1	2.7	—	—	—	—	3.1
Total Europe	25,482	26,189	26,611	97.3	95.8	—	—	—	—	—	—	—	—	—
U. S. S. R.	42,407	44,242	41,419	96.1	102.6	—	—	—	—	—	—	—	—	—
—														
Canada	13,336	13,259	12,831	100.6	103.9	—	—	7.4	—	—	88	—	—	98
United States	41,248	40,125	42,554	102.8	96.9	80.1	—	—	84.7	—	—	80.7	—	—
Total America	54,584	53,384	55,385	102.2	98.6	—	—	—	—	—	—	—	—	—
—														
Syria and Lebanon	27	23	41	95.9	66.8	—	—	—	c)	—	—	—	—	—
—														
Algeria	544	638	605	85.2	89.9	—	—	80	—	—	75	—	—	—
Fr. Morocco	73	103	71	71.5	103.7	...	...	...	e)	—	—	f)	—	—
Tunis	99 (5)	99	104	100.0	94.7	...	...	...	—	—	75	—	—	—
Total Africa	716	840	780	85.3	91.8	—	—	—	—	—	—	—	—	—
—														
Grand Total . (m)	80,809	80,441	82,817	100.5	97.6	—	—	—	—	—	—	—	—	—
Grand Total . (n)	123,306	124,683	124,236	98.9	99.3	—	—	—	—	—	—	—	—	—

* Countries not included in the totals. — a) above the average. — b) average. — c) below the average. — d) very good. — e) good. — f) average. — g) bad. — m) not including U. S. S. R. — n) including U. S. S. R. — (†) See explanation according to the various systems, page 371. — w) Winter crops. — s) Spring crops. — (1) Towards the middle of month. — (2) Towards the middle of preceding month. — (3) Including spelt and meslin. — (4) The area for 1931 is that which it is anticipated will be harvested; for previous years the figures refer to the area harvested. — (5) Provisional estimate made last year on the same date. — (6) Including meslin.

Bulgaria : In June weather conditions and especially the rains towards the middle of the month were very favourable. Harvesting of barley was delayed by the prolongation of the winter. For all cereals an abundant crop, almost equal to that of last year, is expected. Production of mixed grain is estimated at 2,824,000 centals (4,869,000 bushels), 4.2 % above that of last year and 24.1 % above the mean of 1925-1929. Production of spelt has been estimated at 227,000 centals, 25.2 % below that of last year and 34.1 % above the mean of 1925-1929.

Spain : Weather conditions at the end of the spring caused a poor formation of grain with the result that it will perhaps be necessary to modify the data published in the table of cereal production. The great drought has also been detrimental to spring cereals.

Estonia : During the latter half of May the weather was rather warm and the quantity of precipitation sufficient ; during the first half of June, weather conditions were less

favourable, with lower temperatures, little rainfall and strong, cold winds ; there were some night frosts, which, however, caused no appreciable damage to the crops. Weather in the first half of the month was not favourable to spring crops but towards June 15 some rain fell and the weather became warmer, bringing about an appreciable improvement in crop conditions.

Irish Free State : The first half of June is regarded as the wettest period experienced in that month for many years. There was rain every day and flooding occurred on the lowlands. The second half of the month was genial. All cereals made fairly good progress and no damage from storms or pests was reported.

France : The latter half of June was on the whole very favourable ; formation of ears and flowering took place in very good conditions in most of the producing regions where they had not yet been achieved, temperature being moderately high and skies often overcast, and some slight showers occurring. Toward the end of June several periods of very high temperature caused fears of blast in many districts, especially in the Southwest and East. In the first days of July rainstorms caused some very localised damage but in most districts greatly benefitted the crops on the eve of the harvest.

These very favourable conditions very considerably improved wheat, the production of which is expected to be almost average despite some cases of rust, of take-all and of blast. The harvest is over in the South and far advanced in the Southwest ; quality and weight seem satisfactory, especially in the South, where both these and the quantity is very good. The rye crop is also very good. Oats and barley, though infested in some places with weeds and suffering somewhat from the heat, have a good appearance. The rains at the beginning of July did the crops much good and yields should be rather above the average ; in the Paris region winter barley seems to have given satisfaction though no precise conclusions as to the harvest can yet be drawn. Quality does not seem very satisfactory. Buckwheat has a good appearance, though in Brittany it has suffered a little from the drought.

The first half of July was on the whole, favourable for ripening and cutting ; towards the end of the period, however, violent storms caused damage in some regions and particularly to oats.

Great Britain and Northern Ireland : Throughout the area weather in June was wet, dull and rather cold, save for the last week of the month, when warm and sunny conditions effected marked improvement in most vegetation. In Scotland and Northern Ireland some damage from flooding is reported. In England and Wales condition of crops was moderate at the end of June, the unfavourable weather having somewhat discounted their early promise. Throughout the area the crops have suffered, especially on wet and heavy soils, reports of thinness and lack of colour being frequent, though straw is plentiful. In England and Wales wheat, barley, and oats were expected to yield slightly below average. In Northern Ireland the wheat crop is expected to be late ; as barley is sown chiefly on the lighter soils it has not suffered to the same extent as oats and wheat and the braids are in fair condition.

Greece : During June abundant rains with heavy showers and hail in the last ten days of the month, fell over almost the whole of the country, particularly in Macedonia and Thrace, where they provoked floods. Despite the damage done by these adversities, there still remains hope of a good production of cereals, especially of wheat, which is reported to be of excellent quality.

Hungary : In the two weeks from 27 June to 11 July weather was characterised by excessively high temperatures and in the majority of districts by lack of precipitation.

The wheat harvest was in progress in the first decade of July. The straw is generally short, and the ears are small but the quality of the grain is good, though the drought has caused some damage. In various localities damage from insects and hail is reported. The rye harvest is already over and threshing is in progress. The ears are generally short and gappy. Quality of the grain is very varied. Premature ripening is frequently reported. Cutting of winter barley is completed. Spring barley is very weak, low and thin. Oats are in general of very low quality. The drought has induced premature ripening and the grain has been burnt sporadically.

Italy : June was prevalently fine with very high temperatures. In the last two days of the month light showers fell almost everywhere. In some provinces, especially in the South, there were some hailstorms.

The high temperature hastened ripening of late wheats. Harvesting was actively pursued and in some provinces of the South was completed and was well advanced in all the plains and hillsides sections. Threshing of early wheats was being carried on in the plains and that of late varieties had already begun. Harvesting of minor cereals, completed in the Centre, was continued in the North. Despite blast in some provinces in the first half of the month and its accentuation and extension in other provinces in the latter half, a crop of wheat superior to that of last year is still expected.

Latvia : Temperatures in June were slightly below the average. The cold at the beginning of the month was succeeded by higher temperatures on 11 June and in the third decade had become practically average. Precipitation was limited to the first two decades. According to crop correspondents condition of winter wheat was average in 46.0 % of the cases, above average in 16.7 % and below in 37.3 %. Condition of spring crops is better and, expressed according to the system of the Institute, is 115.

Lithuania : The cold, rainy weather of June was unfavourable.

Luxemburg : The generally dry weather in June has checked the normal growth of cereals.

Poland : During June the weather was warm and sunny and rainfall was rather scarce especially towards the end of the month. While the warmth was quite sufficient, soil moisture, although improved a little towards the middle of the month, was again inadequate towards the end of the month causing a slight deterioration in the condition of spring cereals compared with the previous month.

Rumania : In the latter half of June weather conditions favoured cereal crops except in the southern departments of Bessarabia and in the northern region of Dobrudja where the little rain which fell did not improve crop conditions lowered by the drought. In general the crop condition of winter wheat and rye is excellent, while those of spring wheat, barley and oats are less satisfactory. At the beginning of July, cutting of barley had begun everywhere, while wheat was being reaped in southern regions of the country. The anti-locust campaign in the departments of Tulcea, Ismail, Covurlui and Orhei continued also in the period from 15 to 30 June; in the departments of Cetatea Albă the locusts were completely destroyed; similar success was obtained in the departments of Fălciu and Durostor, where sporadic attacks occur.

Switzerland : Following favourable weather the crop condition of winter cereals has also considerably improved compared with the preceding month but the winter damage has not been entirely compensated for. Sowings are generally a little thin so that there has been less "laying" than in previous years; in some districts, however, con-

siderable hail damage has occurred. The warmth is hastening the ripening of cereal crops. Spring cereals have generally developed well but are still a little backward due to the lateness of sowing as a result of persistent cold weather in the spring. Lateness of sowing is also the reason for backward growth of oats in many districts and for the partial spreading of weeds in some fields. Crop condition of spelt on July 1, 1931 (by the Institute's system), was 101 against 97 on June 1, 1931 and 100 on July 1, 1930. Corresponding conditions of mixed grain are 101,98 and 101 respectively.

Czechoslovakia : During June the weather was mostly dry and warm but the very heavy rains which fell in the period June 10-20 accompanied by gusty winds and hail, caused considerable damage to the crops, particularly to rye which, in some districts, was completely destroyed. Of all the cereals, winter rye is in the worst condition (slightly below the average) ; that of winter wheat is average ; those of barley and spring oats are slightly above the average, but the height of the plants is generally below the normal.

Warm weather has considerably accelerated the ripening of cereals, cutting of which had already begun in the first half of July.

Yugoslavia : During the first half of June the weather was changeable. Frequent rains brought about a slight fall in temperature towards the 15th. In the latter half of the month the weather was warmer and dry with very occasional storm rains. These conditions greatly favoured cereals. Wheat looked particularly well towards the end of the month and permits the forecast of an exceptionally heavy crop unless the weather changes for the worse.

U. S. S. R. : According to information issued by the Commissariat for Agriculture, the area sown to all winter and spring crops during the agricultural season 1930-31 had, on July 1, reached about 338,5 million acres compared with 353 anticipated in the plan, that is, about 96 % and about 8 % above that sown last season. While about 98,8 million acres were sown last winter, compared with the 106 million acres planned, the area under spring crops on July 1 was 239.7 million acres or 97 % of the plan, showing an increase of 9.9 % over the 213.5 million acres sown in the spring of 1930.

The situation of spring sowings in the most important cereal producing regions, was as follows : the regions of Kazakstan and the Middle Volga had completely carried out the plan ; the Lower Volga and the Ukraine, about 98 % of the plan ; North Caucasus, 95.0 % and Crimea 91.7 % ; Western Siberia (77.9 %) and Eastern Siberia (82.9 %) were, however, very much in arrears.

With reference to the separate cereal crops, on July 1 there had been sown to spring wheat 63.0 million acres or 90.9 % of the plan ; to spring barley 15.8 million acres or 91.5 % ; to oats 42.5 million acres or 95.9 % of the plan.

The collectivisation of agricultural holdings is proceeding with continuous activity and on July 1 there had been collectivised into " kolkhozi ", 13.7 million of the agricultural holdings of the middle peasants, that is, 55.1 % of the total number of these agricultural holdings. The largest percentages of collectivisation are recorded in Crimea (83.7 %), in North Caucasus (82.2 %) and in the Lower Volga (81.9 %) while backward areas are the Lower Volga (65.8 %), the Ukraine (65.7 %), Western Siberia (53.2 %), Eastern Siberia (43.3 %). Collectivisation has, on the whole, proceeded with greater intensity in the most important cereal producing regions than in other regions. On the same date (July 1), of the area of 239.7 million acres sown this spring, 145.5 million were sown by the " kolkhozi ", 21.8 million by the " sovkhhozi " and 72.4 million by the individual agricultural holdings. It is forecasted that about 70 % of this season's cereal crops destined for the market, will be furnished by the " sovkhhozi " and the " kolkhozi ".

During June, cool, rainy weather predominated in the northwestern area of the Sov-

iet Union, while in the regions of the Centre and Southeast, the weather was changeable with rather more abundant rains from the 10th to the 20th of the month and higher temperatures in the last few days. The appearance of winter cereals during the month was satisfactory and their crop condition on July 1 varied from average to above the average, while spring cereals, which developed normally in the first ten days of the month, deteriorated slightly in the last three weeks of the month; their crop condition on July 1 varied from average to below the average. At the beginning of July cutting of cereals was in full course in the southern regions of the Union. According to the Government's plan, sowings next autumn should occupy 106 million acres, of which 6.9 million in "sovkhozi" and about 64.2 million in "kolkhozi"; with regard to the separate cereal crops, sowings of winter wheat should cover 37.1 million acres; those of rye 67.7 million and those of barley and rapeseed 1.5 million acres.

Canada: The Canadian Government telegraphed on June 23 that there existed a marked regional variation in crop prospects similar to that observed in the last two seasons. In western Manitoba and southern and central Saskatchewan, crops declined further during the week due to intense heat, damaging winds and almost negligible precipitation. The situation in these areas was critical, early sown wheat being either a failure or very light and prematurely advanced into the shot blade stage. The Northern Park belt and all Alberta excepting some eastern districts showed more promise. Heavy rains in Alberta induced good growth.

Further information relating to the following week ending June 30 noted that the variation in crop prospects which is usual at the end of June was heightened this year by very favourable growing weather in Eastern Canada and the Far West and by intense continued drought in the Prairie Provinces. In the latter area further marked deterioration of crop prospects resulted from high temperatures, drying winds and meagre rainfall. Good rains fell, however, in northwestern Manitoba, northern and extreme southeastern Saskatchewan and northern Alberta. Crops in southeastern Alberta were burning, thus extending the critical drought area to slightly over one half of the western wheat land. In British Columbia crops had ample moisture.

In the week ended July 7 the weather in the West was generally rainy and cool. The moisture was extremely helpful to late grain and valuable in filling wheat but, although prospects were consequently slightly improved, they remained the poorest in the bureau records. Grasshopper damage was increasing and sawflies and wireworms were active in Alberta. Rainfall was reported to be inadequate in southeastern and northwestern Alberta. Freezing temperatures and hail in central Saskatchewan and Alberta did little damage.

According to a telegram of July 10, the largest wheat producing areas at the end of June indicated production at one quarter to one half of the average, due to the tremendous deterioration in condition of crops on the prairies in June. After July 1 western crops were measurably improved by rain while in Ontario winter wheat was damaged by drought. In general, crop conditions at the end of June indicated approximately average yields of crops in the Maritime Provinces, Quebec and Ontario.

On the Prairies heavy rains during the week ending July 14 were confined to southeastern Manitoba and northwestern Saskatchewan, showers falling elsewhere. There was a continued improvement in late crop prospects but it was becoming more evident that the rains had fallen too late to save the main wheat crop over the large central area of production. The appearance of rust was reported, at a later date than usual, in southern Manitoba. Grasshoppers and wheat stem maggots were causing damage in Manitoba. There were some heavy hail losses in Saskatchewan. Crops in British Columbia generally improved. In the Maritime Provinces and Quebec weather continued

to be favourable to crop growth. In western Quebec and eastern Ontario, however, the drought of late June and early July lowered yields. Crops in southwestern Ontario had a promising appearance and wheat cutting was general.

United States : In the winter wheat belt, harvesting proceeded under good conditions in the week ending on about June 25. In the Ohio valley, except for some local "laying" the crop was in generally in very good to excellent condition; cutting was general in the southern parts of this area and the crop was turning colour in northern sections. In central parts of the belt wheat was turning colour as far north as southern Iowa with cutting in progress up to the Missouri river in Missouri. Harvesting and threshing were favoured and advanced rapidly in the Southwest. In Kansas wheat was favoured in eastern parts of the State but it was too dry and hot in many western sections; harvesting was well advanced in southern counties of the State. In northwestern areas and the Pacific Northwest wheat progress and condition varied widely, rains bringing about an improvement except on lighter lands where the crops were beyond help. In the spring wheat belt conditions were greatly improved by beneficial rains from North Dakota eastwards, and in some parts of South Dakota. The general condition of spring wheat was good in the eastern producing sections. Oats were largely satisfactory, the crop having headed in the Ohio valley and ripened in some southern parts.

In the following week ending July 2 only slight damage was done to winter wheat by the excessive heat although in some cases ripening was too rapid. In the spring wheat States the crop was only mediocre.

On July 9 the harvesting of winter wheat was well advanced and threshing was in progress in southern sections. Harvest results were satisfactory in both quality and quantity. Damage to spring cereals was reported as a result of the great heat.

On July 16 harvesting of winter wheat was well advanced; the crop condition of spring wheat was mediocre except in the Red River valley. Serious damage was reported, due to the great heat and some grain crops were cut for hay.

Palestine : Harvesting is general and in most parts of the country threshing has commenced.

Syria and Lebanon : Weather conditions have been favourable in Syria. In certain regions of Lebanon, some frost damage is reported but production is nevertheless very good. In the Alawiyya State warm, dry weather, drying up the soil too quickly, was very unfavourable to crops. Rust appeared, causing some damage. In Jebel Druze, the only crops grown, wheat and barley, have already been cut; the estimates are as follows : *Wheat* : area : 105,200 acres against 112,200 in 1930 and 79,400 on the average for 1927-1929; percentages : 93.7 and 132.4; production : 507,000 centals (845,000 bushels) against 493,000 (822,000) in 1930 and 196,000 (326,000) for 1927-1929; percentages : 102.8 and 258.9. *Barley* : area : 27,700 against 22,500 in 1930 and 35,900 for 1927-1929; 123.2 % and 77.3 %; production : 110,000 centals (230,000 bushels) against 71,000 (149,000) in 1930 and 49,000 (102,000) for 1927-1929; 154.3 % and 225.1 %.

Turkey : From June 10 to 20 weather conditions were favourable to agriculture. Field work was possible. Harvesting continued in central Anatolia where recent rains were rather favourable. The rains caused damage, however, in some regions where the sheaves were exposed in the fields.

Algeria : The scirocco from 12 to 14 June was very prejudicial to ripening of wheat, especially to that of late varieties. Numerous instances of blast are reported. Accordingly, the crop, which at the beginning of June was expected to be average, will probably

be rather below the average and considerably below that of last year. The results are poor, especially for soft wheat at 4,960,400 centals (8 267,200 bushels) against 5,727,600 (9,545,900 bushels) in 1930. Barley and oats, ripened in great part before the scirocco, have, however, given fairly mediocre yields, especially oats. While the Department of Constantine has had good cereal crops and that of Algiers is nearly average, the crop in the Department of Oran is very deficient.

Due to the scirocco and the drought the estimates given have been reduced by 25 %.

Egypt: Wheat harvesting was finished in June. Threshing, winnowing and storage are in progress. The yield is 7% above the average.

French Morocco: The scirocco blew frequently towards the end of June, bringing with it intense heat, but did no damage to cereals, which were quite or nearly ripe. First threshing results were very satisfactory as regards both yield and specific weight.

Tunis: Weather conditions have been favourable to cereals in the North and a record production of wheat and oats is anticipated. In the Centre and South, on the contrary, persistent drought during the winter and spring caused yields to be deficient. Barley production is forecasted to be below the average. The figures published should only be taken, however, to represent a general indication as they may still be subject to large modifications.

Argentina: Ploughing and sowing are proceeding slowly due to dry conditions.

Union of South Africa: There has been a considerably increased area planted to wheat this season but weather in May was very dry and more rains were wanted. In the Cape Southwestern districts, however, the principal winter cereal area in the Union, ploughing was satisfactorily completed and a successful season was expected.

Australia. (Telegram of 9 July): Wheat production for 1930-31 is now estimated at 128,000,000 centals (213,000,000 bushels).

(Telegram of 16 July): The excessive raininess of the weather in June was very unfavourable for sowings in New South Wales and Victoria. The area sown and the yield in New South Wales are expected to be below the average of the last five years. In Victoria crop condition is fairly satisfactory. In Western Australia the weather has been cold and the crop looks healthy and strong. In South Australia the area sown is expected to be much the same as last year; weather has been generally very favourable, crop condition is excellent, and a plentiful yield compared to that of last year is expected.

MAIZE

The area sown to maize this year in Rumania shows a considerable reduction compared with last year; in the other European countries for which data are known, the variations are not very important; there is a slight reduction in Italy and slight increases are noted in Bulgaria, Hungary and Czechoslovakia. In the U. S. S. R. the area sown is only a little larger than that of last year. The maize area in the United States, however, has been considerably increased, the acreage planted this year being the largest since 1917.

Crop condition at the beginning of July was in general promising in the Danubian countries and on the whole, gave hope of a crop larger than that of last year. Owing to the drought, prospects seemed to be less favourable in Italy, France and the U. S. S. R.

In the United States weather conditions have been favourable to the maize crop, especially in the northern part of the belt and, although more rain was wanted in the southern section, crop condition on July 1 gave promise of fairly high yields and a production exceeding by over 490 million centals (874 million bushels), the very poor crop of last year and representing one of the best obtained in the last ten years. At the middle of July, rain was wanted.

* * *

Austria : In the early part of July development was rapid and vigorous. Weeding shows good progress.

Bulgaria : Weather conditions, particularly the rains of the latter half of June, were very favourable to development of the maize crop, the second weeding of which was already in progress.

Production is estimated at 17,575,300 centals (31,385,000 bushels), a little below the plentiful crop of last year, 19,074,600 centals (34,062,000 bushels) and above the average of 1925-1929, 14,713,400 centals (26,274,000 bushels), the percentages with respect to these figures being 92.1 and 119.5.

France : The latter half of June was generally very fine and warm, sometimes excessively so. In the South-west and West the drought was beginning to cause anxiety but the rainstorms toward the end of the month and in the first days of July considerably bettered the situation, which, however, became less good at the middle of July, especially in the Southwest due to the drought which rapidly exhausted the small reserves of moisture.

Hungary : In the first decade of July the crop had a good appearance. Late sowings were beginning however, to suffer from the drought, especially on sandy soils.

Italy : In the first half of June cultivations were completed and sowing of the fifty-day variety begun. Reserves of soil moisture which were already beginning to be deficient in the first half of the month were still more so in the latter half and the crop has suffered considerably.

Rumania : The appearance of the maize crop is generally very good except in the regions affected by drought. At the beginning of July the second hoeing was commencing

Czechoslovakia : On July 1, the crop condition of maize in the principal producing areas, was below the average.

Yugoslavia : Weather conditions in the first half of the month favoured the growth of maize. In the latter half of the month the weather was hot and dry but the maize crop preserved its good appearance thanks to the plentiful reserves of soil moisture. On the basis of crop conditions at the end of June, a heavy crop may be forecasted.

U. S. S. R. : According to the preliminary estimates, the area sown as on 1 July was still 21.2 % below that anticipated in the plan. The first ten days of June were favourable to maize ; during the second decade conditions changed for the worse but recovery was good and on 1 July appearance of the crop was satisfactory.

United States : In general, the maize crop made fair to good progress in the week ending June 25 and was unusually well cultivated for the country as a whole. Rains

Maize.

COUNTRIES	AREA					CROP CONDITION (†)									
	1931	1930	Average 1925 to 1929	% 1931											
				1930 = 100	Aver. = 100	I-V II-1931			I-VI-1931			I-VII-1930			
						a)	b)	c)	a)	b)	c)	a)	b)	c)	
Thousand acres															
Austria . . . . .	...	143	146	...	...	2.3	—	—	2.6	—	—	2.5	—	—	
Bulgaria	1,705	1,696	1,671	100.5	102.0	120	—	—	120	—	—	140	—	—	
Hungary	2,735	2,657	2,631	102.9	102.0	—	—	—	—	—	—	—	—	—	
Italy (1)	3,427	3,486	3,541	98.3	96.8	—	—	—	—	—	—	—	—	—	
Rumania	10,178	10,939	10,606	93.0	96.0	...	...	...	e)	—	—	—	—	—	
Switzerland . . . . .	...	3	3	...	...	...	...	...	—	—	96	—	—	—	97
Czechoslovakia	368	364	344	101.2	107.0	—	—	—	—	—	—	—	—	—	
U. S. S. R.	9,742	9,632	8,399	100.6	116.0	—	—	—	—	—	—	—	—	—	
Canada	164	161	174	101.9	94.1	—	—	90	—	—	—	—	—	—	90
United States	105,557	101,413	94,570	104.1	106.0	83.7	—	—	—	—	—	—	—	—	70.0
Algeria	20	21	25	97.5	82.7	—	f)	—	e)	—	—	—	—	—	

(†) For the explanation of signs and figures indicating crop condition see cereals table and note page 371. —
 (1) "Maggengo".

were very helpful in the area west of the Upper Mississippi valley, inducing unusually good growth. Many southern sections, however, needed rain. In the following week ending July 2 growth was generally good. On July 9 maize in the northern part of the belt was in excellent condition, the crop being forward for the season whereas on the same date southern areas needed rain. On July 16 the maize crop was forward for the season; rains were necessary to ensure a satisfactory harvest.

Using as basis the crop condition on July 1, the Department of Agriculture estimates maize production this year at 1,662,054,000 centals (2,967,953,000 bushels), against 1,172,640,000 (2,094,000,000) last year (revised) and 1,546,016,000 (2,760,751,000), the average for 1925-29; percentages: 141.7 and 107.5.

India: Near the end of June, maize in the United Provinces and in Bihar and Orissa was in good condition while the Punjab crop was average to good.

Palestine: Where grown under irrigation in colonies cobs have been formed. Dry sown crops show only poor growth, with the exception of few favoured localities.

Algeria: Spring crops generally suffered from drought and from the scirocco, which repeatedly occurred between the end of May and 15 June and again in the first half of July. Some showers fell toward 20 June. Appearance of the crop is still fairly satisfactory.

Basutoland: Production this season has, as was expected, shown a reduction on that of last year, being only 1,070,000 centals (1,910,400 bushels) against 1,166,000 centals (2,082,300 bushels). Production of Kaffir corn also show a decrease, owing to damage by cut-worms and mealie stalk borer and drought at the flowering period.

French Morocco: Maize and sorghum have been somewhat damaged by frequent scirocco winds and the consequent great heat at the end of June.

RICE

Bulgaria : Weather conditions in June were not very favourable to rice. According to the preliminary estimate, production of rough rice this year is 312,000 centals (693,000 bushels), or 28.3 % below that of last year and 5.0 % below the average of 1925-1929.

Italy : In June there was good growth.

Area under cultivation this year is 317,000 acres against 361,000 in 1930 and 349,000 in 1925-1929, percentages with respect to these figures being 87.8 and 90.8.

U. S. S. R. : Area sown on 1 July was 331,000 acres, 15.2 % below that of last year (390,000 acres)

United States : On June 25 rice crops were in good to excellent condition in Arkansas but much pumping was required locally ; salt water was interfering with irrigation in Louisiana. The preliminary estimate of the area under rice this year is 958,000 acres against 959,000 last year and 950,000, the average for 1925-1929 ; percentages : 99.9 and 100.8 On the basis of this area and crop condition on July 1, production is estimated at 18,395,000 centals (40,876,000 bushels) compared with the revised figure of 18,585,000 (41,300,000) in 1930 and 18,395,000 (40,876,000), the average ; percentages : 98.5 and 99.6.

India : In Bengal crops suffered in the week ending June 10 in parts of the eastern and western districts due to inadequate rain but in the following weeks until the end of the month rainfall varied from light to heavy and the condition of standing crops was fair. Heavy rain in several districts of East Bengal caused some damage. Field operations for winter paddy were progressing at the beginning of July. In Bihar and Orissa rainfall was light and scattered in the first half of June but on the latter half of the month varied from light to heavy and at the end of the month crops were in good condition. In Madras crops were in fair to good condition towards the end of June. Rainfall was light to heavy in the Central Provinces in the latter half of June and sowing of rice continued. At the beginning of July it was reported that rainfall had been generally sufficient in some areas but more was needed for rice plantation in North Konkan and for sowings and the development of seedlings in Karnatak.

Egypt : Weather conditions during June have been favourable to sowing, germination and growth. Water for irrigation is adequate in the authorised region. Some cultivators ventured to grow rice in areas other than authorized regions but artesian water was inadequate. Sowing in the authorized region was completed, as also in the regions where artesian water was available. Early-sown cultivations outside the authorized rice region suffered through inadequacy of water ; 25 % of this cultivation was damaged. In the rice region, however, growth is progressing and crop condition is normal.

POTATOES

Germany : Progress and appearance are generally good.

Austria : Early varieties are showing tubers though these are little developed. Late varieties have good leafage.

Belgium : Area under the crop has been greatly extended. At the end of June harvesting of early varieties was in full swing. Yields are good and prices satisfactory. Late varieties are developing well.

Bulgaria : Weather conditions in June were favourable to the growth of potatoes.

France : Fine, warm weather in the latter half of June again appreciably improved the crop situation. The first half of July was dry and very warm with some thunderstorms. In the Centre doryphora infestation is reported in some areas. In that region, however, the plants have a very good appearance and are well developed, healthy and free of disease. In the Southwest and West they began, towards the end of June, to suffer from the drought, but storm rains at this period and in the first few days of July re-established the situation. Crop condition at the beginning of July gave hope of a good crop. The first lifting has given complete satisfaction.

Production of potatoes.

COUNTRIES	ENGLISH MEASURES			AMERICAN MEASURES			% 1931	
	1931	1930	Average 1925 to 1929	1931	1930	Average 1925 to 1929	1930 = 100	Average = 100
	Thousand centials			Thousand bushels			%	%
Bulgaria	1,720	1,852	820	2,866	3,086	1,381	92.9	207.5
Finland	14,833	17,314	16,784	24,721	28,856	27,972	85.7	88.4
Malta	670	644	599	1,117	1,074	899	104.0	111.8
Netherlands	67,321	56,831	73,267	112,199	94,716	122,100	118.5	91.9

Great Britain and Northern Ireland : In England and Wales it is reported that the season is backward. In Northern Ireland the wet weather of May and early June seriously delayed the completion of planting in many districts, and caused damage to the foliage and prevented normal growth in the case of early planted crops. Both in England and Wales and in Northern Ireland, however, early varieties are reported to be in about average condition, and, in England and Wales, of good quality though rather small. While in England and Wales the main crop appeared promising and a crop up to the average was anticipated, the outlook in Northern Ireland is anything but promising. In the latter area there are general reports of the appearance of blight, and in lowlying districts flooding has caused rotting of the tubers after planting.

Hungary : In the first ten days of July potatoes still had a good appearance. The excessive warmth and drought began to show its effects. Abundant rains were necessary to encourage regular growth.

Italy : In the first half of June the lifting of early varieties extended to the Centre and North; in some localities in the South and the Islands that of the main crop was begun.

Luxemburg : The generally dry weather in June has checked the normal growth of potatoes.

Switzerland : Development has been generally good and crop condition is notably better than last year at the same date.

Czechoslovakia : Weather during June was prevalently dry and warm, but the plants still bore fairly well the insufficiency of moisture.

Production of early potatoes is below the normal.

U. S. S. R. : According to the preliminary data of the Commissariat for Agriculture, the area under potatoes on 1 July had reached 88.9 % of that planned. The growth of

Potatoes.

COUNTRIES	AREA					CROP CONDITION (†)								
	1931	1930	Average 1925 to 1929	% 1931										
				1930 = 100	Aver. = 100									
						1,000 acres					1-VII-1931			1-VI-1931			1-VII-1930
						a)	b)	c)	a)	b)	c)	a)	b)	c)
Germany . . { s)	603	584	594	103.2	101.4	2.6	—	—	2.7	—	—	2.9	—	—
{ t)	...	6,346	6,405	...	...	2.6	—	—	2.8	—	—	2.9	—	—
Austria . . . { s)	...	59	46	...	...	2.5	—	—	2.6	—	—	2.3	—	—
{ t)	...	407	406	...	...	2.4	—	—	2.7	—	—	2.5	—	—
Belgium . . . . .	...	402	408	...	...	...	...	...		f)		d)	...	...
Bulgaria	32	35	26	92.9	122.3	150	—	—	150	—	—	150	—	—
Denmark . . . . .	...	167	173	...	...	—	—	(1) 99	—	—	—	—	—	—
Finland	174	175	172	99.3	101.0	—	f)	—	—	—	—	—	f)	—
Scotland . . . . .	...	123	144	...	...	—	—	95	100	—	—	—	—	—
Hungary	710	682	657	104.1	108.1	—	—	—	—	—	—	—	—	—
Italy	879	863	868	101.8	101.2	—	—	—	—	—	—	—	—	—
Lithuania . . . . .	...	403	347	...	...	3.5	—	—	—	—	—	3.3	—	—
Luxemburg	40	40	40	99.1	99.3	2.5	—	—	2.4	—	—	2.4	—	—
Malta	7	7	7	90.2	97.0	—	—	—	—	—	—	—	—	—
Netherlands	401	397	432	100.9	92.7	(2) 70	...	...	(2) 70	...	...	(2) 73	...	...
Poland . . . . .	...	6,602	6,125	...	...	...	...	...	3.3	—	—	3.4	—	—
Rumania . . . . .	...	463	482	...	...	...	...	...	e)	—	—	—	—	—
Switzerland . . . . .	...	120	117	...	...	103	—	—	99	—	—	—	—	93
Czechoslovakia . . . . .	...	1,646	1,792	...	...	2.5	—	—	2.6	—	—	2.4	—	—
—														
U. S S. R	14,838	14,382	13,658	103.2	108.6	—	—	—	—	—	—	—	—	—
—														
Canada	576	571	552	100.8	104.3	—	—	—	—	—	—	—	—	—
—														
Algeria s)	(3) 20	30	25	66.7	78.5	...	...	—	—	f)	—	—	—	—

(†) For the explanation of signs and figures indicating crop condition, see Cereals table and note on page 371.
 — s) Early potatoes. — #) Late potatoes. — (1) To July, 15. — (2) Middle of precedent month. — (3) Not including Oran.

the plants, which at the beginning of June had sprouted under satisfactory conditions, was favoured by rainfall in the last two decades of June. Crop condition of potatoes toward the end of the month was satisfactory.

Algeria : The early potato crop has given fairly good yields nearly equalling those of last year, but, as the area has been considerably reduced, production will be much smaller. Main crop potatoes promise fairly good yields ; crop condition is satisfactory, thanks to showers at the end of June.

SUGAR

Weather in June varied considerably as between the different European beet-growing countries and in consequence crop condition also shows wide variation. Countries in which beet on 1 July was in prevalently good or even very good condition, due to the adequate soil moisture, rapidity in execution of field work and smallness of damage from disease or other causes, were Germany, Bulgaria, Denmark, France and Turkey.

In other countries where, on the contrary, meteorological conditions were not everywhere good, where in some districts drought was felt, or where work was not executed in time, crop condition on 1 July was only fairly good. Such for example were Belgium, Great Britain, Sweden, U. S. S. R. In Italy and Poland crop conditions were still good

in the early part of July, but development remains dependent on weather in the remaining part of that month. In the Netherlands and Yugoslavia condition varied so much with district that a definite statement for the country as a whole could not be made. In Czechoslovakia, Austria and Hungary condition is rather bad, mainly owing to the prolonged drought.

Summing up, on the basis of these crop conditions and taking account of the relative importance of the industrial countries as sugar producers, it may be said that crop condition for Europe as a whole in the early part of July was still fairly good.

Acreage of Sugar Beet.

COUNTRIES	1931 (1)	1930	Average 1925 to 1929	% 1931	
				1930 = 100	Average = 100
				Acres	%
Germany	872,129	1,157,191	1,002,529	75.0	82.0
Austria	106,000	89,000	61,846	119.0	172.0
Belgium	124,000	137,311	102,316	90.0	76.0
Bulgaria	37,000	48,789	34,046	76.0	106.0
Denmark	74,000	81,000	93,084	92.0	80.0
Spain	240,000	208,960	182,438	115.0	131.0
Irish Free State	8,200	14,389	14,211	57.0	57.0
Finland	4,900	3,090	5,296	162.0	94.0
France	620,000	679,480	583,647	91.0	106.0
Great Britain	231,000	348,364	165,415	66.0	140.0
Hungary	141,776	184,684	169,032	77.0	84.0
Italy	261,609	272,890	225,722	96.0	116.0
Latvia	7,000	5,900	—	125.0	—
Netherlands	91,225	142,196	157,114	64.0	58.0
Poland	408,000	457,000	510,179	89.0	80.0
Rumania	37,000	120,948	166,863	31.0	22.0
Sweden	85,300	96,520	77,983	88.0	109.0
Switzerland	3,600	3,040	3,637	104.0	86.0
Czechoslovakia	441,389	556,316	674,813	79.0	65.0
Turkey	19,769	11,120	(2) 19,739	178.0	100.0
Yugoslavia	120,000	147,798	110,277	84.0	112.0
<i>Total Europe . . . a)</i>	<i>3,933,897</i>	<i>4,765,989</i>	<i>4,481,111</i>	<i>83.0</i>	<i>88.0</i>
U. S. S. R.	3,692,550	2,832,000	1,617,044	130.0	228.0
<i>Total Europe . . . b)</i>	<i>7,626,447</i>	<i>7,597,989</i>	<i>6,098,155</i>	<i>100.0</i>	<i>125.0</i>
Canada	52,000	52,500	45,854	99.0	113.0
United States	754,000	821,000	875,416	92.0	112.0
<i>Total America . . .</i>	<i>806,000</i>	<i>873,500</i>	<i>721,270</i>	<i>92.0</i>	<i>112.0</i>
<i>General Total . . { a)</i>	<i>4,739,897</i>	<i>5,639,489</i>	<i>5,202,381</i>	<i>84.0</i>	<i>91.0</i>
<i> { b)</i>	<i>8,432,447</i>	<i>8,471,489</i>	<i>6,919,425</i>	<i>100.0</i>	<i>124.0</i>

a) Not including the U.S.S.R. — b) Including the U.S.S.R. — (1) Approximate data. — (2) Average 1927 to 1929.

In the table of areas there appear for the first time data for Canada and the United States, which allow the world total to be given; it corresponds this year to 100.0 % of that of last year and 124.0 % with respect to the average. Abstracting the data for the U. S. S. R. these percentages become respectively 84.0 and 91.0.

Germany: Beet has developed well in general and on July 1 its appearance was good. Only occasional gaps are observed in the fields of beet. The necessary field work has been accomplished in good time almost everywhere.

Analysis of beet in the third week of July gives the following results: Mean weight of roots 4.0 oz. against 4.4 last year and 3.5 on the average of 1925-29; mean weight

of leaves 11.6 oz (10.0 and 10.3), sugar per root 0.4 oz. (0.5 and 0.4); sugar content 10.1 % (12.4 % and 9.8 %).

Austria : Owing to the relative deficiency of soil moisture development is slow. Despite the energetic measures against parasites these are showing tenacious resistance. Cultivation is in arrears.

Belgium : Due to the wet weather singling and hoeing have been difficult. The subsequent dry weather allowed the crops to be cleaned. In some districts damage from beet fly is reported.

Sugar Beet.

COUNTRIES	CROP CONDITION (†)								
	1st July, 1931			1st June, 1931			1st July, 1930		
	a)	b)	c)	a)	b)	c)	a)	b)	c)
Germany.	29	—	—	2.8	—	—	2.8	—	—
Austria	—	—	3.1	—	—	3.2	—	—	3.1
Belgium	e)	—	—	—	f)	—	d)	—	—
Bulgaria	120	—	—	120	—	—	150	—	—
Denmark	—	—	(1) 95	—	—	—	—	—	—
Netherlands	—	(2) 63	—	—	(2) 63	—	(2) 73	—	—
Poland . . . . .	...	...	..	—	30	—	3.5	—	—
Switzerland	—	100	—	—	—	—	—	—	—
Czechoslovakia . . . . .	...	...	...	2.9	—	—	—	—	3.1
Canada	—	—	96	—	—	—	101	—	—

(†) For the explanation of signs and figures indicating crop condition, see cereals table and note on page 371.
(1) July, 15. — (2) Middle of preceding month.

Bulgaria: The notable diminution in the area has, despite the good weather conditions in June, caused a marked diminution in production, which is 5,290,000 centals (265,000 short tons), 23.2 % below that of last year but 24.6 % above the mean of 1925-1929.

France : Weather in the latter half of June was fine and warm with some rain towards the end of the month and proved to be rather favourable to the beet. Until now its condition has been satisfactory with no reports of serious damage by insects or disease. Singling has been effected under good conditions; the plants are regular, excepting the last sowings, which came up rather badly. Crop condition at the beginning of July permitted the forecast of a satisfactory crop. Storm rain in several regions at the beginning of July, improved the situation.

Great Britain and Northern Ireland : On the whole the outlook for sugar beet in England and Wales was considered to be fair at the beginning of July.

Hungary : The growth of sugar beet has been checked by the drought. Leaves are beginning to yellow in some places. Abundant rains are needed.

Italy : In the first half of June growth was vigorous and had begun to feel the effects of lack of soil moisture.

Netherlands: Production of beet in 1931 is estimated at 26,043,000 centals (1,302,000 short tons) against 41,101,000 (2,055,000) last year and 46,341,000 (2,317,000) on the average of 1925-29, the percentages with respect to the latter figures being 63.4 and 56.2.

Czechoslovakia : June was prevalently dry and hot and the crop suffered from lack of moisture. Considerable damage from insects, especially beet fly, is reported.

U. S. S. R. : According to preliminary information, the area sown to sugar-beet on July exceeded that planned by 4.6 %. Poor progress was made with weeding in the first half of the month and on the 15th. only 38.9 % of the area sown had been weeded. In the second half of the month this work received a strong stimulus and toward 1 July 70 % had been completed. Crop condition of the beet, which in the first half of the month was above the average, deteriorated slightly towards June 20, followed by an improvement in the last days of the month. Production is expected to amount to about 374,787,000 centals (18,739,000 short tons), with a probable production of 55,116,000 centals (2,756,000 short tons) of refined sugar.

Canada : Production of raw beet sugar in the season 1930-31 is estimated at 1,075,000 centals (53,800 short tons) compared with 789,000 (39,400) in 1929-30 and 806,000 (40,300) the average of the preceding five seasons ; percentage comparisons : 136.3 and 133.4.

United States : On the basis of estimated area and crop condition in July 1, production of sugar beet this year is estimated by the U. S. Department of Agriculture at 151,400,000 centals (7,570,000 short tons) against 184,000,000 (9,200,000) in 1930 and 147,105,000 (7,355,000), the average for 1925-1929 ; percentages : 82.3 and 102.9.

Production of raw beet-sugar in 1930-31 is estimated by the Department of Agriculture at 25,979,000 centals (1,299,000 sh tons) compared with 21,893,000 (1,095,000) in 1929-30 and 21,738,000 (1,087,000), the average for 1925-1929 ; percentages : 118.7 and 119.5. On June 20 sugar-cane was doing fairly well in Louisiana.

India : Rainfall was mostly light during June in the United Provinces but varied from light to moderate in the latter half of the month and on June 27 crops were in good condition. Light scattered rains fell at the middle of June in the Punjab but these was a return to dry weather in the last week of the month, when the condition of standing cane was average to good. At the end of June crops in Bihar and Orissa were in good condition.

Egypt : During June condition have been favourable to growth, accelerated by hot weather. Hoeing and manuring are in progress in the general and late-sown cultivations. Crop condition as at 1st July : 101, against 100 as at 1st June, 1931 and at 1st July 1930.

Union of South Africa : Cane has suffered from the abnormally warm and dry weather along the Natal Coastal belt and condition was 14 % below normal.

Australia. (Telegram of 9 July) : Production of cane in 1931-32 is estimated to be the same as in 1930-31, 78,400,000 centals (3,920,000 short tons), 94.5 % of the average for the five years ending 1929-30, 82,992,000 centals (4,150,000 short tons). The output of cane-sugar is estimated at 11,872,000 centals (593,600 short tons) very slightly below the 1930-31 output of 11,927,000 (496,400) and 5.2 % above the five-year average, 11,283,000 centals (564,200 short tons).

VINES

In the northern hemisphere as a whole June favoured the vines. Growth is everywhere good, the delay due to the prolonged winter and the cold wet spring having been completely overtaken. The vines are everywhere in excellent health condition. Attacks of eudemis, cochylis and pyralid have been limited. The principal characteristic of the year is the absence of cryptogamic diseases, thanks to the drought in June ; attacks

of mildew and oïdium are rare and very mild, and the extended application of sulphate and sulphur gives grounds for hoping that, unless very unfavourable conditions follow, these diseases will not have any very considerable development.

In Central Europe flowering took place under excellent conditions ; the clusters are fairly abundant. Crop condition at the end of June and beginning of July was very satisfactory, despite some local damage caused by storms.

In France, the mainland of Italy and the northern and central provinces of Spain also crop condition was very good and, taking account of the relatively small number of grapes that has appeared in the first two countries and of the frosts in the third, promise a good average vintage, considerably above that of last year.

In southwestern Europe prospects continue excellent.

In Sicily, in the southern provinces of Spain, Levant and Andalusia, as well as in North Africa, the persistent drought, accompanied by heat waves at the end of the month, has caused some damage. Prospects still remain, however, fairly satisfactory.

For the northern hemisphere as a whole, then, crop condition toward the end of June and beginning of July promised a good average vintage.

The trade in wines in June showed for certain countries, France and Hungary, for example, an activity in contrast to the preceding calm and a recovery in prices. This development can only be considered as transitory and a little artificial, at least for France, its result will have been a brisk movement of wine from growers' hands instead of a slow movement from now until the vintage ; trade being apparently abundantly provided for, this phase of activity should be followed by a long period of calm and does not change our conclusions of last month.

In Spain, trade remains very quiet, prices being sustained. In Italy a period of calm succeeded the activity of May save in the export trade to France ; prices have a downward tendency. In these two countries the quantities remaining in growers' hands are small, and trade seems to be provided for. In Germany and Yugoslavia markets are very quiet, demand being poor ; internal consumption is reduced and trade needs adequately supplied ; in Yugoslavia much wine remains in the cellars of producers and in Germany these quantities, though smaller, are also fairly abundant.

On the European market as a whole it seems, then, in face of a limited demand by consumers, that trade is abundantly supplied. The general tendency from now until the next crop may be expected therefore to be calm, with a tendency to lower prices.

In the southern hemisphere, according to preliminary information, the Australian crop seems to be almost the same as that of last year and perhaps a little larger and fairly near the average

* * *

Germany : Prevalently warm and dry weather in June was greatly favourable to the growth of vines. Flowering took place rapidly under good conditions. Storms and hail caused only local damage.

Austria : Development in June was very satisfactory.

Bulgaria : Weather in June greatly favoured development and crop condition toward the end of the month was excellent. Sulphur treatment has been given to combat peronospora.

Spain : Vines have flowered under good conditions.

France : June was, on the whole, favourable to vines. Growth is very good everywhere, despite the drought in the South. Flowering has taken place everywhere under

Vines

COUNTRIES	AREA				CROP CONDITION (†)									
	1931	1930	Average 1925 to 1929	% 1931		I-VII-1931			I-VI-1931			I-VII-1930		
	1,000 acres			1930 = 100	Aver. = 100	a)	b)	c)	a)	b)	c)	a)	b)	c)
Germany . . . . .	...	203	201	..	...	2.0	—	—	2.0	—	—	2.2	—	—
Austria s)	...	77	80	...	...	1.6	—	—	1.9	—	—	2.0	—	—
Bulgaria	217	205	189	106.0	114.8	150	—	—	150	—	—	150	—	—
Spain . . . . .	...	3,242	3,429	...	...	120	—	—	—	—	—	—	—	95
Luxemburg	3	3	4	100.0	84.5	2.3	—	—	2.2	—	—	—	—	3.3
Switzerland . . . . .	...	35	35	...	...	—	—	94	—	—	91	—	—	80
Syria and Leb. . .	130	126	123	103.1	105.8	—	—	—	—	—	—	—	—	—
Algeria { s)	672	601	528	111.8	127.3	e)	—	—	e)	—	—	e)	—	—
French Morocco . .	786	671	(1) 595	117.2	132.0									
Tunis	27	18	15	152.5	187.0									
Tunis	98	87	74	113.1	133.5	e)	—	—	e)	—	—	e)	—	—

(†) For the explanation of signs and figures indicating crop condition, see Cereals table and note on page 371. —
s) Area bearing. — t) Total area. — (1) Average 1926, 1928 and 1929.

(†) For the explanation of signs and figures indicating crop condition, see Cereals table and note on page 371. —

s) Area bearing. — t) Total area. — (1) Average 1926, 1928 and 1929.

good conditions and dropping has been extremely rare. In southern vineyards the grapes are well formed, large and of healthy appearance.

The imagos of eudemis and cochylis have not been very widespread but attacks of the larvae of cochylis in the South seem to have been more extensive than was expected; the second generation of eudemis made its appearance in the last few days of June. Attacks of vine pyralid have been fairly unmerous but losses have been limited to a few smaller vineyards. Practically no damage by cryptogamic disease had been reported at the beginning of July but in the South and Southwest the appearance of powdery vine mildew and mildew was reported after the recent rains and its spreading was considered possible; treatments have been applied very carefully this year. Towards the end of June and the beginning of July, storm rains were to some extent beneficial in the South and Southwest; they were, however, accompanied by hailstorms which caused serious damage, the importance of which cannot yet be determined, over limited sections of some vineyards. The appearance of vines on July 1 was, on the whole, good. As the number of grapes formed is relatively low except in the eastern vineyards, it seems that the quantity of production will not exceed a good average but the present condition permits the hope of a crop larger than that of last year in both quantity and quality.

In the South this year's young plantations are reported to have recovered badly in growth.

The market situation improved considerably during June. The marketing of wine in producers' hands was more active than it had been since the beginning of the season; quotations rose considerably. There was consequently a notable diminution of stocks in producers' hands. Taxed consumption remained satisfactory.

Greece: Frequent and abundant rains in June threatened the normal growth of the vines, particularly in the Peloponnesus region. Thanks to the active application of anti-cryptogamic treatments however, satisfactory yields are forecasted.

Hungary: The weather in the two weeks from June 27 to July 11 favoured the growth of vines. Hail damage is reported from various regions.

Italy: In June vegetation was promising, favoured by the hot dry weather which arrested the spread of cryptogamic diseases. Anti-cryptogamic measures and pruning have not, however, been omitted.

Luxemburg : Vines have flowered under good conditions.

Rumania : At the beginning of July the crop condition of vines was satisfactory. Damage by peronospera and oidium is slight.

Switzerland : Development has been exceptionally good and flowering has proceeded favourably. So far damage from disease has been limited.

Syria and Lebanon : Vines have flowered under good conditions. The total area of vines this year is 130,000 acres compared with 126,000 in 1930 and 123,000 on the average for 1925-29; percentages: 103.1 and 105.8.

Algeria : The falling of the unformed fruit provoked by the scirocco in the first half of June was serious; a large number of grapes are also reported as scorched. The losses caused by oidium appear to be rather extensive in the department of Algiers; the second generation imagos of eudemis and the caterpillars of the vine sphinx have appeared; on the other hand, the invasion of althises appears to be definitely less serious than last year. The situation has thus worsened since last month, but the appearance of the vineyards in the first days of July was still fairly satisfactory. If account is taken of the very marked increase in productive area, the condition of the vines still leaves hope of a crop perhaps greater than that of last year. In fact, according to the last estimate, the area of vines in bearing has increased by 12 % over that of last year. In addition, a still more notable fact, 116,000 acres of new plantings have been made this year, in 1930 there were only 14,100 acres and in 1929 30,000 acres planted; in 1928 the total area was only 229,000 acres above the prewar level.

French Morocco : Fruit formed very abundantly but the scirocco and great heat at the end of June did some damage to the vines.

Tunis : The appearance of vines is good and for the moment prospects for production are also good. No serious damage by disease or insects has so far been reported. June, however, was a dry month and the sirocco blew frequently but reserves of soil moisture still seemed to be sufficient. .

OLIVES

Spain : Olives have flowered under good conditions but have not set well so that although flowering has been very profuse, there is little fruit. Crop condition of olives on July 1 varied from 80 to 85 by the Institute's system.

Italy : In the first half of June flowering proceeded under good conditions. In the latter half of the month there was considerable dropping due to the lack of moisture.

Palestine : On the plains the berries are developing well. A slight fall of berries was noted in the South and in some of the hill-districts. Generally there is every prospect of a good crop. Condition on 1st July was good.

Syria and Lebanon : Olives have flowered under good conditions. The total area this year is 217,000 acres compared with 216,900 in 1930 and 170,000 on the average for 1925-1929; percentages: 100.1 and 127.9. Crop condition on June 1: 102.

Algeria : Olives have flowered very well and fruit formation has been very abundant but early heat accompanying the sirocco winds, has caused some dropping of fruit which will affect crop results. Crop condition on July 1 was good (100) against 95 on June 1.

French Morocco : Fruit formed very abundantly but the sirocco and great heat at the end of June did some damage.

Tunis : The growth of olives has been checked a little everywhere, particularly on heavy lands, by drought and continual sirocco winds during the month. The trees however, were still in good condition on July 1 ; flowering was good.

COTTON

The report of the United States Department of Agriculture, containing the first estimate of area cultivated on 1 July 1931 shows a reduction of 10 % on the area cultivated on 1 July last year. The most important decreases are in Texas, Oklahoma and Arkansas. While the decrease registered is inferior to almost all private estimates, so that its publication was followed by a sharp fall on the Exchange, the season seems to have been so far rather favourable to the crop and the prevalently dry heat seems to have held in check the propagation of cotton pests. A wet, cool May with temperatures below normal was followed by a prevalently dry and sunny June, which has allowed crops to make up in part for the delay in development previously reported. The first half of July was distinctly favourable, with temperatures higher than usual, beneficial rains in the north-east and dry weather in the west, so that in some districts rains were desired. The first official evaluation of crop condition, referring to 1 August and of production, mainly on the basis of the former, will be made known only on 8 August. Meanwhile private estimates give a probable decrease in production of 3 % to 10 %, with respect to last year.

In Egypt, according to private sources, the area planted to cotton this year is 7-13 % smaller than that of last year (2,161,700 acres). Such estimates take into account the change in the area planted to sugar cane, the reduction to a minimum of the area authorised for the cultivation of rice, such reduction being necessitated by the shortage of water and also the Government's policy tending to confine the cultivation of Sakel-laridis in some areas of the northern Delta (see the Bulletin of last April) to those most suitable for it, reducing its area in order to restrict production between the limits imposed by the present state of demand ; the government is, on the contrary, favourable to any increase in production of the other varieties of which some high grades are in full course of expansion. Till now the weather has been fairly favourable, though generally, especially at night in Lower Egypt, moister than usual, which keeps the crop backward. In addition, attacks of leaf worm have been particularly strong, especially in the Delta, favoured by weather, which has not been sufficiently hot and dry to check their development, by the nocturnal humidity, by the lack of money, due to the acute economic crisis, which has allowed only the large proprietors to combat the evil, while the others, not having available the necessary labour, have been unable to repair the damage, which though so far it cannot be precisely estimated, is feared to be serious. Given the heavy quantities to be ginned that exist in the country and on which the Government had last year made advances, it was necessary to make 15 July the last date for ginning of cotton picked in 1930, which was still in June being ginned in important quantities.

The news from India is on the whole, favourable to the crop ; information on the area cultivated being lacking however, since sowings are still in progress.

In the U. S. S. R. area sown has continued to extend, according to the plan to free the Union from all foreign imports. Area this year is 50,5 % above that of last year. Weather seems to have been favourable so far to growth.

Of the Mediterranean cotton countries outside Egypt Algeria shows a marked reduction, as also the Alawiyya State in Syria and Lebanon. In Bulgaria, on the other

hand, it seems that the area has been notably increased. Of the other countries news is lacking — Supplementary information on crops, indicates that in the Anglo-Egyptian Sudan production in 1930-31 is 24 % below that of the preceding year and equal to the average of the five years 1925-26/1928-29; yields are the lowest yet recorded. South Africa also shows a deficit of 38 % on last year. On the other hand, Uganda, like other parts of the British Empire, records a large increase in production for 1930-31.

Bulgaria : Weather conditions in June favoured the growth of cotton. Owing to the fairly considerable increase in area an abundant cotton crop is forecasted, at 26,000 centals (5,400 bales) against 21,400 (4,500) last year and 14,500 (3,000) the average for the period 1925-1929; percentages: 120.5 and 177.2. Production of cottonseed is estimated at 57,000 centals (2,900 short tons) or somewhat higher than the figure for last year.

Italy : In the first half of June growth was satisfactory.

U. S. S. R. : Towards 1 July cotton planting was almost finished. According to preliminary data the area sown at this period was 5,825,000 acres (or 102.5 % of the area forecasted in the plan), against 3,870,000 acres last year and 1,957,000 the average of 1925-1929; percentages 150.5 and 297.6 respectively. The large and rapid increase in area is explained by the intention of the Government to become independent as soon as possible, of foreign cotton. Weather conditions in June were favourable to the growth of cotton.

United States : Weather in the week ending June 25 was marked by high temperatures and scattered rainfall. Growth was mostly satisfactory except in a few of the drier areas. In Texas plants were small for the season and about two weeks late; in Oklahoma growth was very good but the crop was also late. In the following two weeks up to July 9 the cotton crop made fairly satisfactory progress but cultivation was in delay in some parts of the country. On July 16 the progress of the cotton crop was satisfactory but rains were wanted in some producing areas. The Department of Agriculture estimates the cotton area in cultivation on July 1 of this year at 41,491,000 acres, the revision of the corresponding figure for last year being 46,078,000 acres and the five year average of 1925-1929, 46,548,000 acres; percentages 90.0 and 89.1.

India : At the beginning of June in Bombay cotton sowing was continuing in parts but more rain was wanted; irrigation was inadequate as the river was very low. In the period from June 13 to 27 variable rains fell in the south and east Deccan. Rainfall from June 27 to July 4 was generally sufficient in the Major Deccan and sowing was proceeding smoothly; germination of seedlings was good. In other areas of Bombay rainfall varied from nil to heavy. No rain fell in the Sind but the river was rising, and water irrigation was sufficient to permit sowings to continue.

In the third week of June light to heavy showers fell in the Central Provinces; cotton sowing commenced in Nagpur, Amresti and Buldana and was being continued at the end of the month.

Syria and Lebanon : The area planted to cotton in the State of the Alaouites this year is 14,800 acres against 22,200 in 1930 and 6,100 on the average for the preceding five seasons; percentages: 66.7 and 244.0. Crop condition on June 1 was 100, as on June 1, 1930.

French West Africa : Production in 1930-31 seems at least equal to that of last year. On the other hand the volume of sales is very reduced owing to unremunerative prices.

Reductions in costs of transport and ginning, have been effected so as to avoid too marked a regression in the crop.

Algeria. The growth of cotton is very satisfactory but pink bollworm has appeared.

Cameroon (French mandate): Experiments in cotton-growing have been made, on the initiative of the Government, by the agricultural cooperative societies.

Egypt: Weather in June was favourable to growth but there were some damp nights, which encouraged cotton worm and some very hot days, though not so hot as usual for the time of year. Windy weather persisted in Lower Egypt. Crops are several days behind compared with those of last year especially in Upper Egypt, but are in good condition and developing normally. Boll formation is progressing in early varieties generally, as well as in ordinary crops in Upper Egypt, especially in Pilon and Giza 7 varieties. As regards late crops these are still growing and buds have appeared thickly. Flowering has begun in several districts, especially in Upper Egypt. At present the egg masses of the cotton-worm are being picked off for destruction and cultivation, irrigation and manuring are proceeding. Growth is generally satisfactory. Cotton-worm egg-masses have been earlier this year. Infestation has been reported everywhere and is heavier than last year, especially in Lower Egypt. The most serious losses have been reported in the fields adjacent to the Nile. They are especially great after irrigation. Large growers have taken energetic measures to destroy the egg-masses before hatching. The Ministry of Agriculture has also made great efforts. Losses are apparently rather heavy. Wilt is widely prevalent among susceptible varieties, notably Sakellaridis. An abnormal increase of infestation has been observed in the Maarad variety. In some crops of these two varieties the intensity of infestation attains 70 %. As the level of the Nile is below normal, irrigation water in June was scarcely adequate and crops at the further tails of some canals have suffered. The summer rotations now in force are on the basis 6 days watering to 18 days without.

The limit fixed for the ginning of the 1930 crop (cotton season 1 September 1930 to 31 August 1931) which had already been put forward to 30 June 1931 by decree of the Ministry of Agriculture dated 27 November 1930, has been further extended to 15 July 1931 by Ministerial decree of 28 June (Journal Officiel 29 June 1931).

(Telegram of 14 July): From the beginning of the ginning season on 1 September 1930 to 30 June 1931 the following quantities of ginned cotton have been obtained in Egypt, compared with the results on 31 May and on 30 April of the current year:

		30 June	31 May	30 April
		(thousands)		
Sakellaridis	(centals)	1,911	1,664	1,595
	(bales)	400	348	334
Other varieties	(centals)	5,736	5,271	4,849
	(bales)	1,200	1,103	1,014
Total	(centals)	7,648	6,935	6,444
	(bales)	1,600	1,451	1,348
Linters	(centals)	178	161	151
	(bales)	37	34	32

Uganda: The area planted to cotton in the season 1930-31 was 740,000 acres against 663,000 in 1929-30 and 594,000 the average of the preceding five years; percentages:

111.5 and 124.6. Production of ginned cotton is estimated at about 744,000 centals (156,000 bales) against 516,000 (108,000) in 1929-30 and the average of the five years ending 1928-29, 681,000 (142,000).

Preparation of the soil for the new sowings has been effected in delay due to the protraction of the work of killing locusts and sowing of food crops. At the beginning of June, some cotton had already been planted in the Eastern Province and in Buganda. The growers intended as far as possible to plant most of the cotton in the months of June and July in order that the plants might develop in the most favourable growing season. No appreciable reductions in area are forecasted.

Anglo-Egyptian Sudan : The latest provisional estimate of production is 508,600 centals (106,400 bales) of ginned cotton against 665,400 (139,200) in 1929-30 and 508,000 (106,300), the average of the preceding five seasons ; percentages : 76.4 and 102.4.

Togo (French Mandate) : Information regarding the 1930-31 season leads to the expectation of almost average yields despite the early drought and some damage from cryptogamic diseases.

Union of South Africa . Picking was general in June. Grading figures indicate a much smaller production than last year, 40,000 centals (8,400 bales) compared with 64,500 centals (13,500 bales), a decrease of 38 %, and of 27 % on the average of the five years ending 1928-29, 54,700 centals (11,400 bales)

FLAX

A. FIBRE. — There are at present available numerical data on the area of flax for fibre only for a few European countries : Finland, Italy, the Netherlands, and Czechoslovakia. They all indicate a considerable decrease in area as compared both with 1930 and the five-year average. That in the Netherlands, where area has been reduced by 57 % with respect to 1930 and to the average, is particularly marked and significant. Considerable contraction in the crop has, according to non-official sources, also occurred in Belgium, in France (around 50 %), and the Baltic States.

In contrast to this general decrease, probably common to all the European flax-growing countries, there has been a marked increase in the U. S. S. R., where the area sown this year to flax for fibre (dolgunets), according to official data, has attained 5,684,000 acres against 4,448,000 in 1930 and 3,152,000, the average of the five years 1925-1929, that is, an increase of 28 % in respect to 1930 and of 80 % in respect to the five-year average. This increase largely compensates for the decrease in other centres of production.

Crop condition in the Netherlands at the beginning of July was slightly above the average ; the production of flax expected this year is about 41 % below that of last year and less than half that of the preceding quinquennium ; In Great Britain, Northern Ireland and France crop condition is good ; in Belgium it is average and in the U. S. S. R. satisfactory. It appears that in the Baltic countries also weather in the latter half of June was on the whole favourable.

The general position of prices is considerably below that of last year and is about that of the prewar period.

B. LINSEED. — At the present moment data are available for the area sown to linseed in the U. S. S. R., the United States, India and Canada, countries which, after Argentina, are the principal producers. Only the United States records a decrease in area sown of about 15 % compared with last year, while increases are reported of about 35 % in the

U. S. S. R., about 14 % in Canada and about 8 % in India. The total area of linseed crops in these four countries is larger by about 13 % than in 1930 and by about 30 % than the average of the preceding five years

Weather conditions have been decidedly unfavourable in Canada and not very good in the United States, so that the total production of North America is anticipated to be considerably smaller, by over 20 %, than that of last year and the average. In the U. S. S. R. crop condition appears to be satisfactory.

* * *

Austria : The crop is for the most part weed-infested. Early sowings are in flower.

Belgium : The crop has a good appearance but is much reduced. Condition on 1 July was average against excellent on 1 July 1930.

Bulgaria : Weather in June favoured development. Thanks to the increase of 50 % in area there is a notable increase in production of fibre, and this year's total is estimated at 3,300 centals, 26.2 % above that of last year and over double the average for 1925-1929. Production of seed is estimated at 4,400 centals (7,900 bushels), 19.5 % above that of last year and over two-and-a-half times the average for 1925-1929.

Irish Free State : Area is estimated to be not more than one-fifth of normal.

France : The latter half of June favoured sprouting and at the beginning of July the crop had a good appearance.

Great Britain and Northern Ireland : In most districts of Northern Ireland the crop is looking well but on wet land growth has been slow.

Hungary : Flax plants are rather short and the fields are infested with weeds. The quantity of the crop is generally average.

Flax.

COUNTRIES	AREA SOWN					CROP CONDITION (†)											
	1931	1930	Average 1925 to 1929	% 1931		1-VII-1931			1-VI 1931			1-VII-1930					
	1,000 acres					1930 = 100	Aver. = 100	a)	b)	c)	a)	b)	c)	a)	b)	c)	
Austria . . . . .	...	8 (1)	11	...	...	2.6	—	—	2.4	—	—	2.8	—	—	—	—	—
Belgium . . . . .	...	50	59	...	...	—	f)	—	—	f)	—	d)	—	—	—	—	—
Bulgaria	1	1	1	154.3	210.1	120	—	—	120	—	—	130	—	—	—	—	—
Finland (2)	10	14	13	72.7	74.6	—	—	—	—	—	—	—	—	—	—	—	—
Italy	24	27	47	90.1	51.4	—	—	—	—	—	—	—	—	—	—	—	—
Lithuania . . . . .	...	204	211	...	...	3.1	—	—	—	—	—	3.1	—	—	—	—	—
Netherlands	16	37	37	43.2	43.2	(3) 69	—	—	(3) 69	—	—	—	—	—	(3) 62	—	—
Czechoslovakia . . .	27	31	52	87.9	53.3	—	—	—	—	—	—	—	—	—	—	—	—
Yugoslavia (4) . . .	17	17	—	97.8	—	—	—	—	—	—	—	—	—	—	—	—	—
U. S. S. R.	7,489	5,553	4,264	134.9	175.6	—	—	—	—	—	—	—	—	—	—	—	—
Canada	661	532	563	118.6	117.3	—	—	—	46	—	—	—	—	—	—	—	95
United States	3,132	3,602	2,909	84.8	107.7	—	—	—	60.2	—	—	—	—	—	—	—	78.4
India	3,020	2,802	3,392	107.8	89.0	—	—	—	—	—	—	—	—	—	—	—	—
Tunisia	5	—	6	—	84.9	...	...	...	e)	—	—	—	—	—	—	—	—

† For the explanation of signs and figures indicating crop condition: see Cereals table note on page 371. —

x) Average 1927 to 1929. — (2) Flax and hemp. — (3) Middle of preceding month. — (4) Winter crops.

Netherlands : Production of fibre is estimated at 112,000 centals against 192,000 last year and 253,000, the average of the five years ending 1929, percentages with respect to these figures being 58.6 and 44.4.

Czechoslovakia : On 1 July crop condition was prevalently average.

U. S. S. R. : Flax sowing, which proceeded very slowly until the beginning of June, made rapid progress in June thanks to energetic measures taken by the Government. On 1 July the area sown exceeded the plan by 21.2 % ; on 1 July crop condition was satisfactory.

United States : Production of linseed this year is forecasted by the U. S. Department of Agriculture, on the basis of estimated area and crop condition on July 1, at 10,024,000 centals (17,900,000 bushels) compared with the revised figure of 11,984,000 (21,400,000 produced last year and the five year average (1925-1929) of 11,713,000 (20,917,000) ; percentages : 83.6 and 85.6.

Palestine : Harvesting has been completed. Good yields are general.

OTHER PRODUCTS

Tea.

India : According to a report dated June 11 received from the Indian Government, in North India the weather during May was variable but might be described generally as seasonable. Prospects were fair. Statistics to the end of May recorded a decrease of 787,680 lbs. compared with the same period of last year.

In South India, during the early part of May, the weather was hot and dry but later monsoon conditions prevailed and crop prospects were good. Outturn was 5 % above that to the same date of last year.

Ceylon : The serious drought in May had a bad effect on the crop and at the beginning of June its condition was bad, but abundant rains in the latter month somewhat improved crop condition, which on 1 July was average.

Cacao.

Gold Coast : By the beginning of July all of the last major crop had, with very few exceptions, been harvested.

The minor crop had almost all been harvested in the Eastern Province but in other provinces excessive rains in June had delayed harvesting though 45 % had been harvested in the Central Province. In the Eastern Province the crop is stated by growers to be slightly smaller than last year but in the Central Province and Ashanti is stated to be normal. In the Central Province the percentage of germinated beans is high. In the Eastern Province there were little holdings and quite half the crop had already been marketed ; in the Central Province little of the current minor crop had been put up for sale and in Ashanti and the Western Province a tendency to hold for better prices was reported.

While flowering and setting of the major crop had been retarded in the Western Province by the continuous rains, setting was reported to be elsewhere satisfactory despite the unfavourable weather. In the Central Province there were indications that the major crop season would begin early and in Ashanti at the normal time.

	June 1931	June Aver 1927/1930	Oct - June 1930-31	Oct.-June Aver 1926-27/1929-30
Shipments per steamer (long tons)	10,081	8,046	201,990	203,150
(ooo centals)	226	180	4,525	4,551
Arrivals by rail at Takoradi and Accra				
(long tons)	1,359	2,695	119,448	139,561
(ooo centals)	30	60	2,675	3,126

Groundnuts.

Egypt : Weather conditions during June have been favourable to growth. Plants are growing satisfactorily. Early-sown cultivations have started flowering. Weeding has been continued.

Crop condition on 1 July was 100 as on the same date last year.

Rapeseed, Sesamum and Mustard.

Austria : At the end of June the harvest was well advanced. On 1 July crop condition was 2.6 as on 1 June, against 2.5 on 1 July 1930.

Bulgaria : The notable increase in area and the favourable weather conditions in June lead to expectations of a good yield of colza, about 10 centals (20 bushels) per acre. A preliminary estimate of production gives 428,000 centals (855,000 bushels), 32.8 % above that of last year and 86.1 % above the mean of 1925-1929. Production of sesame has been estimated at 60,000 centals (3,000 sh. tons,) 8.9 % below last year's and more than double that of the average 1925-1929. Crop condition on 1 June was very good for both crops.

France : The latter half of June favoured colza, harvesting of which commenced towards the beginning of July.

Hungary : At the end of the first decade of July harvesting was almost at an end. Production is qualitatively good and quantitatively average.

Netherlands : The area of colza, to be harvested this year is 4,900 acres against 5,540 in 1930 and 5,890 on the average of 1925-1929, the percentages with respect to the latter figures being 89.2 and 83.9. Crop condition on 15 June was 67 (average) against 75 at the same date last year (very good).

Palestine : Crops are fair in the coastal plains of the Northern Circle and in a few favoured portions of the South. All other areas are very poor.

Tobacco.

Belgium : Planting is completed. In the Wervicq district the area is less than last year. Crop condition on 1 July was average against excellent at the same date last year.

Bulgaria : During June, the condition of tobacco remained satisfactory and despite the 5 % decrease in area this year, it is anticipated that last year's good crop will be equalled. The preliminary estimate of production is 529,000 centals or 100.2 % of that of the previous year and 87.3 % of the average for 1925 to 1929.

Greece : Abundant rains and especially falls of hail during June, damaged tobacco crops. It is reported however, that the damage is not grave and the tobacco crop is anticipated to be satisfactory.

Hungary : The growth of tobacco leaves is generally satisfactory. There has only recently occurred a check to development by drought. Occasional damage by hail is reported.

Italy : In the first half of June the crop, of which transplanting had been completed, appeared in general to be well up.

U. S. S. R. : Planting of tobacco was hastened during the period June 10-30. According to preliminary information on 1 July the area sown was 406,000 acres, or about 86 % of that planned, compared with 246,000 last year and 214,000 the five year average of 1925-1929. Percentages : 165.3 and 189.7 respectively. The area planted to better quality tobacco was 186,000 acres or 83.31 % of the plan, and that planted to tobacco of lower quality, 220,000 acres or 111.3 %. Toward the end of June crop condition was satisfactory.

United States : On June 25 tobacco crops were generally in need of moisture, especially in the southeast, but beneficial rains fell in Wisconsin. The preliminary estimate of the area under tobacco this year is 2,090,000 acres compared with the revised figure of 2,112,000 for last year, and 1,787,000 the average of 1925-1929; percentages : 99.0 and 117.0. Production is estimated on the basis of crop condition on July 1 and the estimate of acreage planted, at 1,525 million lbs. against the revised figure of 1,565 million lbs. for last year and the average of 1,357 million lbs., percentages : 97.4 and 112.4.

Palestine : The crop is developing well. Fair yields may be expected.

Syria and Lebanon : The area planted to tobacco this year in the State of the Alaouites is 4,900 acres, against 3,700 in 1930 and 3,900, on the average for the preceding five years; percentages : 133.3 and 127.7. Crop condition on June 1 was 100 as on June 1, 1930.

Algeria : The first sowings have recovered well, but late transplantings have suffered greatly from the drought. On July 1, their crop condition was, however, judged to be only average at 80, while on June 1, 1931 it was good (100) as on July 1, 1930. The area planted is estimated at 46,000 acres, representing an increase of 4.1 % compared with last year (45,000 acres), but a decrease of 28.8 % compared with the average of 1925-1929 (65,000).

Hops.

Belgium : Due to the low prices the crop is in many cases neglected. Condition on 1 July was bad against good at the same date last year.

Great Britain and Northern Ireland : In the latter part of June the crop on the whole made good growth, though it was in some cases rather backward. Downy mildew was more prevalent than usual. It was expected that yields will be below average.

Czechoslovakia : The hop crop promises an excellent yield.

United States : According to the preliminary estimate of the U. S. Department of Agriculture, the area of hops this year is 21,000 acres against the revised figure of 20,000 in 1930 and 23,400, the average of 1925-1929; percentages : 105.0 and 89.8. Production is estimated, on the basis of crop condition on July 1, at 23,500,000 lbs. compared with 23,400,000 (revised) last year and 31,383,000 the average of 1925-1929; percentages : 100.4 and 74.9.

Hemp.

Austria : Crop condition on 1 July was 2.5 against 2.8 on 1 July 1930.

Bulgaria : Production of hemp fibre this year is estimated at 42,000 centals compared with 36,000 last year and 30,000, the average of 1925-1929. Percentages: 116.9 and 138.3. Production of seed is forecasted at 35,000 centals against 40,000 last year and 25,000, the average of 1925-1929; percentages: 89.1 and 139.7.

Hungary : Due to the drought, hemp plants are rather short. An average crop is anticipated.

Italy : In the first half of June the crop was well developed.

Area under hemp this year is 161,000 acres against 214,000 in 1930 and 236,000 in 1925-1929, percentages with respect to these figures being 75.2 and 68.5.

Czechoslovakia : On 1 July crop condition was prevalently average.

U. S. S. R. : According to preliminary data of the Commissariat for Agriculture, area on 1 July was 2,277,000 acres, 94.7 % of that fixed under the Plan, against 1,853,000 in 1930 and 2,322,000 on the average of 1925-1929. Percentages with respect to these figures: 122.9 and 98.1. Weather in June favoured growth and crop condition on 1 July was satisfactory.

Sericulture.

Bulgaria : Owing to a marked decrease in the quantity of eggs incubated, this year's production of cocoons is expected to be very poor. According to a preliminary estimate it is placed at 2,650,000 lb. against 4,995,000 lb. last year and 4,388,000 lb. in 1925-1929, the percentages with respect to the latter figures being 53.0 and 60.3.

Italy : Leaf production has been much in excess of the needs of the silkworms.

Syria and Lebanon : The total area of mulberry trees this year is 66,800 acres against 66,600 in 1930 and 61,100 on the average for the period 1925-1929; percentages: 100.2 and 109.2. Weather conditions have favoured the growth of the leaves. Crop condition on June 1 was 100. Conditions for silkworm rearing were good on June 1. The quantity of eggs incubated this year is estimated at 84,700 ounces against 100,600 in 1930 and 95,900 on the average for the period 1925-1929. Percentages: 84.2 and 88.3. In Lebanon production of cocoons is estimated at 4,409,000 lbs. compared with 5,291,000 and 4,295,000 respectively; percentages: 83.3 and 102.7.

FODDER CROPS

Germany : At the beginning of July, the first cutting of meadows and clover was in progress. The quantitative results are generally satisfactory, while quality falls below expectations.

Austria : The rather dry and warm weather of June favoured the first cutting both of temporary and permanent meadows. On the other hand, vegetation of meadows for several cuttings is backward and poor.

As regards production of hay from temporary and permanent meadows quality is generally satisfactory and in some cases excellent, though quantity often leaves much to be desired. Communal pastures offer little feed for stock but alpine pastures are quite rich. On 1 July condition of fodder crops not included in the principal table was as follows: mixed fodder and vetches: 3.0 (against 2.8 on 1 June this year and 2.8 on 1 July 1930); maize for green fodder: 2.9 (2.8, 2.9) and alpine pastures: 2.4 (2.7, 2.6).

Belgium : Fodder crops and prairies are producing abundantly but require rain. At the beginning of June the moisture hindered hay-making but a little later this was ac-

complished under more favourable conditions. At public auctions grass fields have found almost no buyers and prices have reached extremely low levels.

Bulgaria : Favoured by the rains in the latter half of June crops had a very good appearance toward the end of the month. Except for permanent meadows abundant output is expected according to the preliminary estimates which are as follows :

		1931	1930	% 1931 1930 = 100
Permanent meadows	(ooo centals)	18,828	22,787	82.6
	(ooo sh. tons) . . .	941	1,139	
Vetches	(ooo centals)	7,496	6,834	109.7
	(ooo sh. tons) . . .	375	342	
Temporary meadows	(ooo centals)	3,759	2,487	151.2
	(ooo sh. tons) . . .	188	124	
Mangolds	(ooo centals)	1,653	1,323	125.0
	(ooo sh. tons) . . .	83	66	
Mixed fodder	(ooo centals)	1,032	860	120.0
	(ooo sh. tons) . . .	52	43	

Estonia : If drought does not set in good yields of hay may be expected from the permanent meadows. Yields of clover will probably equal those of last year.

Irish Free State : Mangolds made poor progress in the first half of June, which was very rainy, but improved in growth with the subsequent favourable weather and at the end of the month looked promising. Pastures carried a good covering of grass. Hay-making began a fortnight later than usual, owing to the unfavourable weather. Yields of first crop hay are well up to average. Meadows are anticipated to give a yield above average.

Finland : Area and production of the principal fodder crops compared with those of last year are as follows :

	Area (ooo acres)			Production					
	1931	1930	% 1930 = 100	(ooo centals)		(ooo sh. tons)		% 1930 = 100	
				1931	1930	1931	1930		
Permanent meadows	1,186	1,186	100.0	10,477	9,437	524	472	111.0	
Temporary meadows	2,929	2,545	115.1	63,365	57,979	3,168	2,899	109.3	
Roots and tubers in general.	74	82	90.9	12,422	16,874	821	844	76.3	
Turnips	54	63	86.3	9,066	14,089	498	703	70.8	
Pasture	1,236	1,730	71.4	—	—	—	—	—	
Grasses and mixtures of grasses and legumes	49	44	111.1	—	—	—	—	—	

France : The latter half of June and the beginning of July, despite the occurrence of some storm rain, were very favourable months for harvesting. Although quality is a little below the average in the Centre and in some areas of the Paris Basin ; it is excellent in most producing regions and a heavy crop of permanent and temporary meadow hay may be counted upon ; it will greatly exceed requirements for the coming season due to the existence of fairly large stocks remaining from last year. Clover has been especially abundant but alfalfa rather deficient although its quality compensates for the smallness of quantity. Quality is rather satisfactory everywhere except in some areas of temporary meadows which show a little mixture with inferior grasses.

The appearance of fodder crops is good, although the roots have suffered a little from drought in the West and Southwest but recent rains at the end of June and the

beginning of July have improved the situation. In Brittany swedes have been sown under good conditions.

Great Britain and Northern Ireland : The generally wet weather has resulted in very satisfactory growth of pastures but the lack of warmth and sunshine has lowered feeding value. Owing to the unfavourable weather and to arrears of other work, hay-making commenced later than usual but was general at the end of June, though in Scotland and some areas of England and Wales under unsatisfactory conditions. In England and Wales yield of seeds hay was expected to be about 35.3 centals (1.8 short tons per acre), or nearly 4.5 centals (0.2 short tons) above the average of the ten years 1921-1930. In Northern Ireland it is anticipated that yield will be well up to average and, with suitable weather, quality satisfactory. The yield of meadow hay in England and Wales was expected to be about 24.6 centals (1.2 short tons) per acre or nearly 2.8 centals (0.1 short tons) above the ten-year average. In Northern Ireland also meadow hay promises to be a heavy crop.

Mangolds germinated well in England and Wales though, owing to lack of sun and warmth, growth has been backward, as also in Northern Ireland, where, however, they are making satisfactory growth where early sown. Sowing of turnips and swedes was greatly hindered in England and Wales by the bad weather, and in some areas land intended for this crop has not been sown. In some districts of Northern Ireland sowing of swedes had to be abandoned and yellow turnips substituted. Where sown in England and Wales turnips and swedes germinated well and in most districts were comparatively free from fly. In Northern Ireland early-sown turnips were looking well and thinning had been completed or was in progress, but late-sown turnips were in a less satisfactory state. Land under roots as a whole in England and Wales has been unusually infested by weeds, cleaning operations having been hindered by bad weather.

Hungary : The second cutting of clover and alfalfa is finished. The yield is good in quality and average in quantity. The yield from the first cutting of permanent meadows is fairly good. Pastures are furnishing little feed for the livestock.

Italy : In the first half of June production from the first cutting of the meadows had been abundant, but that of the second cutting was expected to be poor, owing to the unfavourable weather. This was confirmed in the latter half of the month. Seeds grass mixed with wheat is well up. Pastures are mediocre.

Latvia : According to the reports of crop correspondents crop condition of clover was average in 61.9 % of the cases, above average in 30.5 % and below in 7.6 %.

Lithuania : Development was hindered by the cold rainy weather in June.

Netherlands : Weather conditions in June were favourable to the meadows and pastures : growth has been very satisfactory. The area sown to clover (in thousand acres) is 77.7 against 76.4 last year and 82.4, the average for the period 1925-29 (percentages : 101.6 and 94.3) ; for temporary meadows the figures are 45.5, 37.5 and 37.4 (percentages : 121.5 and 121.6) ; for other fodder crops 15.6, 16.3 and 16.0 (96.3 % and 98.2 %).

Rumania : At the beginning of July, meadow and pasture grass was abundant.

Switzerland : Weather in June was characterised by remarkably high temperatures as well as by very frequent rain-storms. The alternations of hot periods and rains has greatly favoured development of the crops. Permanent and temporary pasture have given a first cut of good quality, and, thanks to fine days, the crop was for the most part brought satisfactorily. Growth of aftermath is satisfactory.

Condition of the alps is excellent and has rarely been so satisfactory.

Czechoslovakia : Haymaking has been somewhat hastened but yields are not entirely satisfactory, especially in the case of clover.

The Condition of Fodder Crops.

Crops and Countries	Crop Condition (†)								
	July 1, 1931			June 1, 1931			July 1, 1930		
	a)	b)	c)	a)	b)	c)	a)	b)	c)
CLOVER.									
Germany	2.8	—	—	2.8	—	—	2.7	—	—
Austria (1)	—	3.0	—	2.9	—	—	2.1	—	—
Estonia	—	—	97	105	—	—	111	—	—
Italy	d) e)	—	—	e)	—	—	d) e)	—	—
Latvia	120	—	—	—	100	—	(2) 150	—	—
Lithuania	130	—	—	137	—	—	130	—	—
Netherlands { red clover.	(2) 67	—	—	—	—	—	(2) 79	—	—
{ white clover.	(2) 80	—	—	—	—	—	(2) 80	—	—
Canada (3)	—	—	97	—	—	98	—	100	—
United States	—	—	—	—	—	77.3	—	—	75.2
Egypt.	—	100	—	—	100	—	—	100	—
ALFALFA.									
Germany	2.7	—	—	2.8	—	—	2.4	—	—
Austria	—	3.0	—	2.8	—	—	2.8	—	—
Italy	d) e)	—	—	e)	—	—	d) e)	—	—
Canada	—	100	—	—	100	—	—	—	97
United States	...	..	..	—	—	79.4	—	—	79.1
MANGOLDS:									
Germany	2.8	—	—	2.7	—	—	2.9	—	—
Austria	—	3.0	—	2.9	—	—	2.7	—	—
Bulgaria	160	—	—	160	—	—	200	—	—
Denmark	—	—	(4) 93	—	—	—	—	—	—
Italy	d) e)	—	—	—	e)	—	d) e)	—	—
Lithuania	—	—	97	—	—	—	—	—	90
Switzerland	—	100	—	—	—	97	—	—	97
TEMPORARY MEADOWS:									
Austria (5)	2.5	—	—	2.5	—	—	2.2	—	—
Bulgaria	110	—	—	110	—	—	115	—	—
Denmark	(4) 106	—	—	—	—	—	112	—	—
Scotland	105	—	—	—	100	—	—	—	95
Finland	109	—	—	—	—	—	117	—	—
Italy	d) e)	—	—	—	e)	—	d) e)	—	—
Switzerland	4.4	—	—	4.4	—	—	4.5	—	—
United States (6)	...	...	...	—	—	76.2	—	—	72.4
PERMANENT MEADOWS:									
Germany { irrigated meadows.	2.1	—	—	2.3	—	—	2.3	—	—
{ other meadows	2.4	—	—	2.5	—	—	2.7	—	—
Austria	2.7	—	—	2.8	—	—	2.5	—	—
Bulgaria	150	—	—	150	—	—	150	—	—
Denmark	—	—	(4) 92	—	—	—	102	—	—
Scotland	—	100	—	—	—	—	—	—	—
Estonia	123	—	—	—	—	—	114	—	—
Finland	109	—	—	—	—	—	109	—	—
Italy	d) e)	—	—	—	e)	—	d) e)	—	—
Latvia	117	—	—	—	100	—	(2) 120	—	—
Lithuania	108	—	—	116	—	—	—	100	—
Netherlands (7)	(2) 82	—	—	—	—	—	(2) 87	—	—
Switzerland	4.3	—	—	4.4	—	—	4.4	—	—
PASTURES:									
Austria	—	—	3.1	2.9	—	—	—	—	3.1
Denmark	—	—	(4) 95	—	—	—	102	—	—
Scotland	—	100	—	—	100	—	—	—	95
Italy	d) e)	—	—	—	e)	—	d) e)	—	—
Netherlands	(2) 81	—	—	—	—	—	(2) 82	—	—
Switzerland	4.6	—	—	4.2	—	—	4.3	—	—
Canada	—	—	98	—	—	97	101	—	—
United States	...	...	...	—	—	78.5	—	—	74.6

a) above the average. — b) average. — c) below the average. — d) excellent. — e) good. — f) average. — g) bad. — h) very bad. — (†) See explanation of the various systems on page 371. — (1) Red clover. — (2) At the middle of June. — (3) Clover and hay. — (4) At 15th July. — (5) Klee grass. — (6) Tame hay. — (7) Meadows for hay.

U. S. S. R. : In June weather favoured crops. Towards the end of the month hay-making was in full swing in many districts.

Canada : According to information received from the Canadian Government, at the end of June root crops in the East promised good yields. Approximately average yields of all crops were expected in the Maritime Provinces, Quebec and Ontario, hay and pasture being most promising. After July 1, however, hay crops in Ontario were damaged by drought. In British Columbia crops had ample moisture but excessive rains damaged hay. Rainy and cool weather in the week ending July 7, was extremely helpful to pasture and hay.

In the Maritime provinces and Eastern Quebec, weather in the week ending July 14, continued favourable to crop growth. In Western Quebec and eastern Ontario, however, the continued drought lowered the yields of hay and root crops. In southwestern Ontario crops have a promising appearance.

Harvesting of the heavy hay crop was begun in the East at the end of June.

The preliminary estimates of the areas sown to fodder crops this year compared with data for 1930 and the average of the previous five years, are as follows :

	1931	1930	Average 1925-1929	1930 = 100	% 1931 Aver. = 100
	(000 acres).				
Hay and clover . . .	10,607	10,618	10,037	99.9	105.7
Alfalfa	748	744	807	100.5	92.7
Fodder maize	425	426	473	99.7	89.8
Turnips, mangolds, etc.	218	226	200	96.5	108.8

On July 1, crop conditions (by the Canadian system) of fodder maize and turnips etc., were 96 and 97 respectively compared with 99 and 100 on July 1, 1930.

United States : On about June 25 rains were needed for pastures in many sections from Kansas and Iowa southward and southeastward. Beneficial rains fell, however, in the northern Great Plains. In the great western grazing area conditions were largely satisfactory except for dryness in some northern Rocky Mountain sections.

Area and production of hay in 1931 are estimated as follows :

	1931	1930	Average 1925-1929	1930 = 100	% 1931 Aver. = 100
	Area (000 acres).				
Tame hay	54,591	54,080	59,172	100.9	92.3
of which :					
Alfalfa	12,304	11,653	11,171	105.6	110.1
Clover	26,757	28,376	—	94.3	—
	Production.				
Tame hay (000 centals) .	1,582,000	1,556,000	1,887,280	101.7	83.8
(000 sh. tons) .	79,100	77,800	94,364		
of which :					
Alfalfa (000 centals) .	550,000	572,000	586,588	96.2	93.8
(000 sh. tons) .	27,500	28,600	29,329		

Palestine : In Jewish and German colonies harvesting of hay crops is completed ; yields were heavy. Early sown crops for fodder maize gave good yields.

Algeria : Harvesting of hay from permanent and temporary meadows is finished. The crop is estimated to be considerably below the average.

Egypt : The last cutting of bersim was over in June. Late sown areas left for seeds are progressing towards maturity. Harvesting in the late-sown areas is in progress. The yield is expected to be normal.

French Morocco : Due to frequent sirocco winds towards the end of June and the consequent intense heat, pastures have, in many cases, become inadequate.

LIVESTOCK AND DERIVATIVES

Condition of Livestock and Dairy Production.

Belgium : Health is good. Abundance of fodder makes feeding less costly.

Irish Free State : Milk yields improved considerably during June as compared with the previous month, but supplies reaching creameries were not quite up to last year's level.

Great Britain and Northern Ireland : Home-grown feeding stuffs were reported to be becoming scarce in Northern Ireland though there were sufficient supplies to meet requirements. Throughout the area, however, supplies of concentrated feeding stuffs are ample for the season, prices are low and expected to fall even lower.

Livestock in Northern Ireland generally are in good condition and have benefitted from the abundance of grass, though those run on pastures sodden by the heavy rain-falls are only in fair condition. Except in districts where the grass is poor, store cattle have thriven very well. Dairy stock are in good condition. Milk yields were reported as normal in England and Wales, well-maintained in Scotland, and on the whole continuing to show an improvement in Northern Ireland.

In England and Wales the net fall of lambs in 1931 is estimated at about 7,800,000, a result well up to the average. The number of lambs born per 100 ewes was estimated at 128, compared with 128 in 1930 and 126 in 1929. Owing largely to the excessive rains in many parts of the country, mortality among lambs was, however, 11 % of the total number born, compared with 9 % in 1930 and in 1929. On the other hand, the comparatively mild winter helped the breeding ewes to maintain good condition ; the total number of ewes lost was about 300,000 a mortality of 4 %, compared with 4 % in 1930 and 5 % in 1929.

Netherlands : Milk production in June was normal except in the province of Drenthe, where a fairly considerable diminution was recorded, and in the provinces of Groningen, Gelderland and Zeeland where production is estimated to be 5 % above the normal.

Switzerland : The preliminary results of the enquiry made by the Swiss Peasants' Secretariat for June indicate a diminution of 7 % in milk deliveries compared with those of the same month of last year.

United States : The data of average numbers of laying hens and pullets and average layings in the main laying period, may give some indication of total egg production :

	1931	1930	Average 1925-1929
Average number of hens and pullets of laying age in farm flocks on June 1	72.0	74.9	75.1
Aggregate of average layings per farm flocks on the first day of the months January to June	196.2	196.5	189.0
Aggregate of average layings per 100 birds on the first day of the months January-June	247.1	237.6	232.1

There has been a continued large reduction of the number of hens and pullets of laying age in farm flocks since the beginning of 1931, the figure of 72.0 being the lowest in the last seven years. Aggregate layings since January 1, have been about the same as last year but the rate of layings per hen and pullet on the first day of each month was above the seasonal average except on April 1. The usual seasonal decline in laying took place after May 1.

The average number of chicks and young chickens of this year's hatch in farm flocks on June 1, was 128 birds against 149 in 1930 (a reduction of 14 %), and 141 in 1929.

Algeria. Livestock remain in excellent condition, but have suffered from the heat and excessive variations in temperature. Pastures are becoming thin; in the North, the animals are finding feed on stubble but in the South pastures are insufficient.

French Morocco: Livestock was in excellent condition at the end of June despite the sirocco and great heat, as they found feed on the stubble.

Livestock in Switzerland.

The Federal Bureau of Statistics has just published the preliminary results of the census of livestock on 21 April 1931. The figures for that date in comparison with those for 1926 are as follows:

CLASSIFICATION	Census		CLASSIFICATION	Census	
	21st April 1931	21st April 1926		21st April 1931	21st April 1926
HORSES	140,023	139,668	PIGS	924,271	637,098
<i>under 4 years</i>	13,210	12,763	Young pigs { up to 2 months	247,790	(1) 108,776
born in 1930 or later	4,924	—	{ 2 to 6 months	349,140	230,479
" 1929 " "	3,111	—	Pigs for fattening over 6 months	234,883	237,728
" 1928 " "	3,119	—	Sows	88,722	57,542
" 1927 " "	2,086	—	Boars	3,636	2,573
4 years and over	126,763	126,905	SHEEP	183,638	169,723
Stallions	192	185	Lamb up to 6 months	40,907	(2)
Mares	5,364	5,480	Wethers over 6 months: for slaughter	25,211	(2)
Draught-horses	121,227	121,240	for rearing	108,720	(2)
MULES	3,689	3,854	GOATS	235,827	289,258
ASSES	795	943	Kids for slaughter	32,451	35,851
CATTLE	1,609,013	1,587,399	{ for rearing	30,817	38,604
Calves up to 6 months: for slaughter	56,820	48,185	He-goats	4,175	4,409
for rearing	224,846	197,551	Milk goats and others	168,884	210,394
Young stock from 6 months to 2 years	109,066	108,530	POULTRY	4,897,233	4,176,791
Heifers { 1 to 2 years	188,435	185,379	Fowls	4,844,909	4,116,853
above 2 years	104,326	100,264	Fowls of all kinds: Chickens up to 2 months	451,334	—
Cows	866,922	875,874	Fowls over 2 months	4,393,575	—
Bulls { 1 to 2 years	29,081	25,178	Geese and ducks	52,324	60,938
above 2 years	7,633	8,073	BRETRIVES	298,248	262,535
Oxen { 1 to 2 years	12,243	15,263	RABBITS	820,156	—
above 2 years	9,642	13,102			

(1) Sucking pigs only. — (2) Not enumerated in 1926.

TRADE

COUNTRIES	MAY				TEN MONTHS (August 1-May 31)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1931	1930	1931	1930	1930-31	1929-30	1930-31	1929-30	1929-30	1929-30

Exporting Countries:

Wheat. — Thousand centals (1 cental = 100 lbs).										
Bulgaria	802	0	0	0	2,361	33	0	930	66	980
Hungary	170	959	0	0	4,844	9,145	0	0	9,943	0
Lithuania	4	13	0	0	536	31	4	2	55	2
Rumania					(1) 6,530	(1) 313	(1) 7	(1) 40	1,279	40
U S S R					(2) 61,893	(2) 3,305			5,732	
Yugoslavia	11	377	0	0	2,844	12,610		2	13,298	2
Canada	17,714	8,080	11	20	117,478	70,147	64	591	93,481	602
United States	3,845	3,261	639	734	33,832	45,274	9,824	6,041	57,274	7,885
Argentina	10,038	4,934			55,131	79,126			86,889	
Chile					(2) 428	(2) 9	(2) 0	(2) 0	481	0
India	2	15	368	95	1,804	265	5,417	3,589	2,768	3,931
Turkey					(3) 181	(3) 7	(3) 7	(3) 408	24	414
Algeria					(2) 5,315	(2) 2,535	(2) 540	(2) 525	3,206	556
Tunis	60	55	99	2	1,418	2,070	509	97	3,362	99
Australia	8,054	2,628	0	0	61,258	20,968		0	24,469	0
Importing Countries:										
Germany	0	4	1,283	1,431	265	2,282	13,629	28,429	2,293	31,725
Austria	0	4	531	510	84	37	3,962	4,641	68	6,455
Belgium	412	9	2,079	2,083	1,307	730	22,998	21,149	808	25,794
Denmark	13	2	593	196	35	128	3,607	2,464	125	2,903
Spain					(2) 4	(2) 11	(2) 0	(2) 2,145	11	2,162
Estonia	0	0	22	31	0	0	306	459	0	540
Irish Free State					(2) 18	(2) 0	(2) 5,053	(2) 4,303	0	5,547
France	0	1,144	4,142	1,122	968	3,858	32,558	18,204	8,907	19,954
Gr. Brit and N. Ir.	35	68	8,574	9,315	600	1,338	102,061	95,229	1,432	114,048
Greece	0	0	1,422	871	0	0	11,402	10,293	0	12,389
Italy	0	0	5,000	4,747	22	4	41,628	18,552	4	27,150
Latvia					(2) 0	(2) 0	(2) 873	(2) 1,089	0	1,523
Norway			187	170			2,679	1,907		2,216
Netherlands	35	2	917	1,060	672	187	14,360	12,009	281	14,936
Poland	97	7	2	4	1,601	223	46	243	289	331
Portugal			71	260			278	2,513		3,732
Sweden	0	29	205	313	31	992	2,619	4,328	1,003	4,982
Switzerland	0	0	699	668	2	0	9,845	7,881	0	9,590
Czechoslovakia	0	4	600	445	4	75	5,584	3,185	108	3,602
Japan			2,019	1,270			12,425	9,467		10,322
Syria and Lebanon					(2) 115	(2) 2	(2) 37	(2) 141	26	146
Egypt					(3) 2	(3) 11	(3) 763	(3) 2	13	24
Union of South Africa					(3) 0	(3) 0	(3) 1,188	(3) 1,440	0	1,680
New Zealand					(3) 0	(3) 130	(3) 93	(3) 126	180	170
Totals	41,342	21,595	29,463	25,353	361,673	256,446	303,857	262,314	317,795	316,568

Exporting Countries:

Rye. — Thousand centals (1 cental = 100 lbs).										
Germany	0	368	75	35	1,213	8,918	628	1,812	10,526	1,822
Bulgaria	110	0	0	0	1,270	9	0	0	9	0
Hungary	33	320	0	0	1,526	2,564	0	0	2,919	0
Poland	137	525	0	0	5,624	6,219	0	18	7,293	26
Rumania					(1) 750	(1) 355	(1) 0	(1) 0	377	0
Czechoslovakia	4	68	2	42	474	1,085	121	196	1,326	264
U. S. S. R.					(2) 11,023	(2) 1,288			4,991	
Yugoslavia	0	2	0	0	0	33	4	0	33	0
Canada	62	60	0	0	728	133	0	150	194	156
United States	11	7			84	1,369			1,378	
Argentina	93	4			538	736			767	
Turkey					(3) 282	(3) 32	(3) 0	(3) 81	183	
Algeria					(2) 35	(2) 31	(2) 0	(2) 4	65	
Importing Countries:										
Austria	0	0	392	229	9	0	1,968	2,008	2	
Belgium	22	0	401	53	99	4	2,738	756	7	
Denmark	0	0	811	489	0	2	6,596	5,093	2	
Estonia	0	0	26	95	0	0	143	1,418	0	
Finland	0	0	46	203	0	0	1,323	2,842	4	
France	0	2	119	0	0	4	1,164	1,544	7	
Italy	0	0	53	40	0	0	581	218	0	
Latvia					(2) 0	(2) 4	(2) 220	(2) 1,733	7	
Lithuania	13	37	0	0	163	66	0	0	0	
Norway	0	0	104	328	0	0	0	0	0	
Netherlands	174	7	112	227	628	73	0	0	0	
Sweden	2	0	13	132	4	11	0	0	11	
Switzerland	0	0	18	7	0	0	0	0	0	
Totals	661	1,499	2,163	1,878	24,379	26,000	36,557	26,636	36,224	2,882

COUNTRIES	MAY				TEN MONTHS (August 1-May 31)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1931	1930	1931	1930	1930-31	1929-30	1930-31	1929-30	1929-30	1929-30
Exporting Countries:										
Oats. — Thousand centals (1 cental = 100 lbs.).										
Germany	0	1,296	168	13	218	13,051	723	595	15,245	620
Irish Free State . . . . .	..	..	..	..	(2) 243	(2) 584	(2) 236	(2) 51	661	115
Hungary	0	37	18	0	13	681	88	0	728	0
Lithuania	2	24	0	0	84	169	0	0	179	0
Poland	7	179	0	0	128	1,457	0	64	1,803	66
Rumania . . . . .	..	..	..	..	(1) 1,288	(1) 1,122	(1) 0	(1) 0	1,834	0
Czechoslovakia	0	146	4	11	710	1,197	13	112	1,345	128
U S S R . . . . .	..	..	..	..	(3) 9,513	(3) 1,008	—	—	1,658	—
Yugoslavia	0	0	0	9	2	9	84	42	9	51
Canada	560	33	0	40	1,458	452	294	1,179	679	1,182
United States	4	37	55	7	101	1,396	198	37	1,578	49
Argentina	1,265	937	—	—	11,471	5,441	—	—	6,508	—
Chile . . . . .	..	..	..	..	(3) 1,175	(3) 287	(3) 0	(3) 0	622	0
Algeria . . . . .	..	..	..	..	(2) 1,036	(2) 340	(2) 126	(2) 119	459	128
Tunis	9	40	0	0	478	714	9	0	860	0
Importing Countries:										
Austria	0	0	295	229	2	0	1,786	2,176	2	2,707
Belgium	0	0	218	187	2	2	2,932	2,271	4	2,773
Denmark	0	2	75	381	20	20	988	2,326	20	2,800
Estonia	0	0	40	18	0	0	137	0	0	106
Finland	0	0	20	37	7	0	146	383	0	476
France	0	9	223	83	18	68	1,702	1,554	77	1,671
Gr. Brit. and N. Irel.	33	31	670	1,235	370	284	8,534	7,745	306	9,658
Greece	—	—	0	4	—	—	0	205	—	207
Italy	0	0	203	157	0	0	3,435	1,272	0	1,700
Latvia . . . . .	..	..	..	..	(2) 4	(2) 57	(2) 53	(2) 88	163	99
Norway	0	0	0	0	4	2	4	79	2	170
Netherlands	11	13	119	229	355	172	2,767	3,212	185	3,728
Sweden	0	2	60	73	40	57	915	1,127	60	1,230
Switzerland	0	0	260	359	2	0	3,942	3,761	0	4,398
Australia	4	7	0	0	66	35	0	2	49	4
Totals	1,895	7,799	2,438	3,071	28,805	28,595	29,070	28,496	35,034	34,126

Maize. — Thousand centals (1 cental = 100 lbs.).

COUNTRIES	MAY				SEVEN MONTHS (November 1-May 31)				TWELVE MONTHS (Nov. 1-Oct. 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1931	1930	1931	1930	1930-31	1929-30	1930-31	1929-30	1929-30	1929-30
Exporting Countries:										
Bulgaria	456	659	0	0	2,884	2,297	0	0	4,017	0
Hungary	20	192	581	0	231	3,062	1,261	4	3,351	132
Rumania . . . . .	..	..	..	..	(1) 6,065	(1) 9,321	(1) 0	(1) 0	28,424	2
Yugoslavia	615	1,160	0	0	5,576	8,596	7	9	12,013	33
United States	478	428	42	29	1,197	3,274	450	176	4,303	708
Argentina	12,626	4,769	—	—	80,436	45,109	—	—	96,381	—
Brazil . . . . .	..	..	..	..	(2) 11	(2) 311	—	—	328	—
Java and Madura	344	243	—	—	1,695	1,468	—	—	1,759	—
Indo-China . . . . .	..	..	..	..	(2) 1,526	(2) 1,213	—	—	2,339	—
Syria and Lebanon . . . . .	..	..	..	..	(2) 139	(2) 251	(2) 35	(2) 4	434	35
Egypt . . . . .	..	..	..	..	(3) 4	(3) 11	(3) 29	(3) 7	20	35
Union of South Africa . . . . .	..	..	..	..	(3) 1,021	(3) 1,541	(3) 0	(3) 0	12,287	0
Importing Countries:										
Germany	0	0	580	888	0	0	4,363	10,818	0	16,594
Austria	0	0	568	379	2	7	3,071	2,756	18	4,382
Belgium	68	35	1,510	855	432	157	8,514	6,612	220	12,595
Denmark	0	0	1,045	520	0	0	5,079	3,728	0	6,254
Spain . . . . .	..	..	..	..	(2) 0	(2) 0	(2) 2,079	(2) 3,102	0	8,548
Irish Free State . . . . .	..	..	..	..	(2) 9	(2) 9	(2) 4,716	(2) 3,190	29	8,077
Finland . . . . .	..	..	..	..	..	..	..	..	..	..
France	2	15	1,052	626	35	29	10,969	9,019	48	17,557
Gr. Brit. and N. Ir.	165	298	3,933	1,836	1,312	1,102	27,836	15,746	2,150	20,599
Greece . . . . .	..	..	..	..	..	..	..	..	..	..
Italy	0	0	833	871	4	4	7,829	8,647	7	15,557
Norway . . . . .	..	..	..	..	..	..	..	..	..	..
Netherlands	24	68	2,198	1,698	201	364	17,148	14,004	626	2,557
Poland	0	2	84	62	0	2	207	192	4	2,557
Portugal . . . . .	..	..	..	..	..	..	..	..	..	..
Sweden . . . . .	..	..	..	..	..	..	..	..	..	..
Switzerland	0	0	104	95	0	0	1,733	1,489	0	6,000
Czechoslovakia	0	0	1,085	441	0	0	6,832	3,026	2	2,557
Canada	2	0	534	452	7	2	2,874	4,236	4	2,557
Japan . . . . .	..	..	..	..	..	..	..	..	..	..
Tunis	2	0	20	0	2	2	260	0	2	2,557
Totals	14,892	7,369	14,938	9,471	162,789	18,132	112,436	84,715	168,694	152,599

(1) (2) (3) See notes page 418.

COUNTRIES	MAY				FIVE MONTHS (January 1-May 31)				TWELVE MONTHS (January 1-Dec. 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1931	1930	1931	1930	1931	1930	1931	1930	1930	1930
Rice. — Thousand centals (1 cental = 100 lbs.).										
<i>Exporting Countries:</i>										
Spain					(2)	209 (2)	437 (2)	0 (2)	0	1,252
Italy	209	472	7	11	1,539	1,856	22	33	4,716	134
United States	262	203	57	20	1,316	1,122	234	179	2,621	208
India	5,598	6,001	88	0	23,742	34,615	183	18	57,318	130
Indo-China					(2)	6,865 (2)	10,651			
Siam	2 172	1,715			11,345	11,215			24,727	
Egypt					(3)	267 (3)	331 (3)	24 (3)	90	1,206
<i>Importing Countries:</i>										
Germany	176	187	974	1,010	419	578	2,386	2,284	1,594	5,508
Austria	0	0	55	57	0	0	267	251	0	606
Belgium	13	2	119	168	64	4	478	419	9	1,047
Denmark	0	0	13	7	0	0	60	49	0	139
Estonia			2	2			11	11		35
Irish Free State					(2)	0 (2)	0 (2)	20 (2)	18	0
France	68	187	615	445	390	902	2,134	2,006	1,903	5,650
Gr. Brit. and N. Ir.	20	31	364	423	95	108	1,105	1,107	218	2,564
Greece			49	49			227	209		546
Hungary	0	2	79	2	0	7	225	64	9	388
Latvia					(2)	0 (2)	2 (2)	20 (2)	7	62
Lithuania	0	0	2	4	0	0	9	11	0	31
Norway			9	9			58	37		101
Netherlands	289	245	465	573	1,003	838	1,305	1,563	2,035	3,563
Poland	20	13	397	326	55	26	408	659	126	1,177
Portugal			75	95			243	359		941
Sweden			77	71			77	82		101
Switzerland	0	0	26	26	0	0	168	134	0	408
Czechoslovakia	0	0	99	121	0	0	300	348	0	979
Yugoslavia	0	0	35	33	2	0	192	141	2	516
Canada	0	0	115	97	0	0	390	337	0	584
Chile							(3)	139 (3)	172	518
Ceylon	4	0	717	622	9	4	4,341	4,738	9	10,809
Java and Madura					(2)	46 (2)	4 (2)	2,953 (2)	4,052	117
Japan	628	64	285	368	2,247	101	1,043	1,931	1,252	3,073
Syria and Lebanon					(2)	0 (2)	2 (2)	71 (2)	97	2
Turkey					(3)	0 (3)	0 (3)	40 (3)	44	2
Algeria					(2)	0 (2)	0 (2)	46 (2)	40	9
Tunis	0	0	4	2	0	0	15	9	0	24
Union of S. Africa					(3)	0 (3)	0 (3)	196 (3)	194	0
Australia	11	4	2	2	64	33	18	40	71	75
New Zealand					(3)	0 (3)	0 (3)	13 (3)	15	0
Totals	9,459	9,126	4,110	4,543	49,677	62,536	19,435	21,748	119,803	48,363

Linseed. — Thousand centals (1 cental = 100 lbs.).										
<i>Exporting Countries:</i>										
Estonia	0	0	0	0	2	2	0	0	55	2
Lithuania	7	0	0	0	119	53	0	0	443	
Argentina	2,213	1,100			21,689	13,905			25,466	
India	328	1,305	0	0	884	2,244	0	0	5,763	0
Tunis	0	0	0	0	0	0	0	0	9	0
<i>Importing Countries:</i>										
Germany	0	2	681	547	7	15	4,057	2,469	26	5,104
Belgium	4	7	564	130	37	46	1,883	723	68	1,676
Denmark			60	46			220	176		359
Spain							(2)	150 (2)	110	419
Finland	0	0	11	7	0	0	37	29	0	79
France	0	2	573	448	11	7	2,315	1,572	15	4,288
Gr. Brit. and N. Irel.	0	2	765	359	4	7	3,715	1,680	9	5,031
Greece	0	2	13	7	0	2	37	18	2	64
Hungary	2	0	0	15	9	7	2	86	143	106
Italy	0	0	141	134	0	0	516	370	0	1,175
Latvia					(2)	44 (2)	40 (2)	24 (2)	37	168
Norway			18	44			185	170		857
Netherlands	7	13	915	417	40	110	4,502	2,377	146	5,617
Poland	0	0	99	29	4	15	192	79	31	150
Sweden			106	119			448	353		798
Czechoslovakia	0	0	84	20	2	4	229	154	18	445
Yugoslavia	0	0	24	18	0	2	71	46	2	121
Canada	271	73	0	159	273	77	0	386	788	454
United States			838	814			2,767	5,917		7,090
Japan			22	7			90	31		128
Australia	0	0	0	26	0	0	163	164	0	340
Totals	2,432	2,506	4,914	3,353	23,125	16,536	21,603	16,943	33,215	34,059

(2) (3) See notes page 418.

COUNTRIES	MAY				FIVE MONTHS (January 1-May 31)				TWELVE MONTHS (January 1-Dec. 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1931	1930	1931	1930	1931	1930	1931	1930	1930	1930
Butter. — (Thousand lbs.)										
<i>Exporting Countries:</i>										
Austria	11	51	586	185	1,164	1,614	690	262	4,112	545
Denmark	33,226	37,064	414	375	154,095	152,922	825	827	372,558	1,389
Estonia	2,566	2,299	0	0	8,300	7,782	0	0	31,010	0
Irish Free State	3,947	3,527	0	0	1,354 (2)	3,790 (2)	3,122 (2)	2,628	58,815	3,391
Finland	717	1,071	3,437	745	18,186	18,554	0	0	37,726	7
France	49	359	110	0	3,754	3,851	27,159	8,788	12,095	12,924
Hungary . . . . .	...	...	...	...	589	1,338	112	0	3,430	40
Latvia	1,318	1,257	0	0	8,889 (2)	9,427 (2)	13 (2)	13	40,630	49
Lithuania	9,110	10,185	335	168	4,447	3,212	0	0	16,219	0
Netherlands	1,413	1,636	13	0	22,055	38,266	2,335	1,371	92,394	4,396
Poland	3,183	4,936	0	7	8,234	7,798	15	0	26,714	29
Sweden	2,339	2,917	—	—	19,835	26,398	4	13	58,857	18
U. S. S. R.	15	37	51	29	27,441	23,351	—	—	23,149	—
Argentina . . . . .	...	...	...	...	163	278	146	112	51,156	—
Syria and Lebanon	13,285	4,491	0	0	487 (2)	536 (2)	117 (2)	31	561	282
Australia . . . . .	...	...	...	...	85,162	54,141	—	—	2,161	172
New Zealand . . . . .	...	...	...	...	37,663 (2)	92,339	0	0	126,411	2
<i>Importing Countries:</i>										
Germany	22	24	19,279	23,312	121	247	84,720	106,325	578	293,560
Belgium	227	249	2,092	1,726	1,001	999	15,159	8,296	2,648	22,412
Spain	1,303	525	30,994	68,189	33 (2)	68 (2)	15 (2)	15	101	328
Gr. Brit. and N. Irel. . . . .	...	...	...	...	21,107	6,898	361,720	327,756	21,023	764,782
Greece	163	185	384	101	496	670	3,932	1,003	1,843	3,115
Italy	262	0	7	60	1,025	229	71	182	236	1,530
Norway	0	2	2,017	1,852	4	20	9,136	6,878	42	18,786
Switzerland	2	9	977	148	300	439	1,215	192	694	714
Czechoslovakia	280	82	214	2,952	492	313	2,511	29,855	1,179	38,805
Canada	203	287	168	326	1,032	1,587	571	1,583	2,471	2,967
United States	—	—	68	104	—	—	260	362	—	723
Ceylon . . . . .	—	—	...	...	—	—	3,309 (2)	2,930	—	7,657
Java and Madura	—	—	20	37	—	—	117	359	—	611
Japan . . . . .	—	—	...	...	(2)	24 (2)	24 (2)	1,362 (2)	82	3,232
Algeria . . . . .	—	—	...	...	(3)	2 (3)	2 (3)	597 (3)	42	2,417
Egypt	0	0	84	62	2	2	390	273	13	829
Tunis	73,541	71,793	111,378	100,433	487,447	457,095	536,500	502,705	1,197,671	1,186,336
Cheese. — (Thousand lbs.)										
<i>Exporting Countries:</i>										
Denmark	807	1,138	40	68	3,708	4,047	209	287	12,623	809
Finland	653	408	2	2	2,748	1,637	11	19	4,638	85
Italy	9,878	9,557	1,124	1,118	37,241	35,426	4,107	4,544	80,568	12,562
Lithuania	159	123	2	2	833	556	4	4	1,980	11
Norway	137	93	44	53	768	542	262	306	1,880	750
Netherlands	15,025	18,016	79	108	72,173	77,991	505	591	206,739	1,510
Poland	236	243	88	112	1,188	871	328	425	3,267	1,074
Switzerland	4,766	5,276	496	348	24,019	26,958	2,518	1,868	60,146	4,251
Czechoslovakia	728	785	302	302	3,514	2,668	1,248	1,135	8,274	2,863
Yugoslavia	362	150	22	24	1,296	653	106	132	4,583	300
Canada	1,517	1,885	190	254	3,737	4,400	613	780	69,955	1,779
Australia	26	183	4	22	2,557	1,773	15	128	7,273	150
New Zealand . . . . .	...	...	...	...	88,146 (2)	80,068 (2)	2 (2)	0	201,256	7
<i>Importing Countries:</i>										
Germany	455	399	9,469	10,942	2,504	2,229	45,303	50,047	5,410	137,459
Austria	578	225	683	732	2,079	963	2,546	2,513	4,482	5,637
Belgium	60	93	3,435	4,063	208	326	18,514	18,958	880	51,394
Spain . . . . .	...	...	...	...	(2)	77 (2)	37 (2)	1,153 (2)	207	5,336
Irish Free State . . . . .	...	...	...	...	(2)	33 (2)	46 (2)	814 (2)	194	2,850
France	2,465	4,275	7,064	5,007	14,696	18,556	31,813	23,464	38,921	65,524
Gr. Brit. and N. Irel.	597	747	31,257	34,174	2,961	3,735	149,740	146,044	8,927	348,592
Greece	33	37	439	112	104	148	1,490	1,261	282	2,802
Hungary	0	7	33	40	62	29	132	196	98	886
Portugal	—	—	49	68	—	—	205	287	—	1,010
Sweden	—	—	168	90	—	—	670	534	—	1,470
United States	154	150	5,855	12,357	831	908	25,122	34,485	2,130	68,818
India	0	0	51	71	0	2	377	410	7	1,183
Java and Madura . . . . .	—	—	...	...	—	—	(2)	443 (2)	474	1,671
Syria and Lebanon . . . . .	...	...	...	...	(2)	26 (2)	57 (2)	196 (2)	132	730
Algeria . . . . .	...	...	...	...	(2)	77 (2)	79 (2)	2,826 (2)	212	10,867
Egypt . . . . .	...	...	...	...	(3)	26 (3)	22 (3)	2,123 (3)	60	7,553
Tunis	4	2	278	161	11	7	899	750	29	1,746
Totals	38,179	43,891	61,169	70,232	265,707	265,714	291,354	298,192	727,960	739,704

(2) (3) See notes page 418.

COUNTRIES	MAY				TEN MONTHS (August 1-May 31)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1931	1930	1931	1930	1930-31	1929-30	1930-31	1929-30	1929-30	1929-30
Cotton. — Thousand cents (1 cental = 100 lbs).										
<i>Exporting Countries:</i>										
United States . . .	1,790	1,155	75	267	33,596	33,947	421	1,821	5,927	1,889
Argentina . . .	42	115	—	—	300	377	—	—	597	—
Brazil . . .	—	—	—	—	(2) 476	(2) 1,310	—	—	1,351	—
India . . .	1,116	1,345	212	79	12,785	13,190	1,356	392	15,172	600
Egypt . . .	—	—	—	—	(3) 4,557	(3) 4,908	(3) 0	(3) 0	1,367	0
<i>Importing Countries:</i>										
Germany . . .	128	174	542	571	1,420	1,574	7,258	8,012	1,885	8,944
Austria . . .	0	0	35	46	0	2	395	481	2	562
Belgium . . .	18	4	123	190	148	90	1,429	1,717	106	2,037
Denmark . . .	—	—	11	13	—	—	128	123	—	146
Spain . . .	—	—	—	—	(2) 20	(2) 40	(2) 1,702	(2) 1,713	44	2,207
Estonia . . .	0	0	7	9	0	0	71	110	0	130
Finland . . .	—	—	11	9	—	—	2	152	121	2
France . . .	42	35	586	567	456	522	7,480	7,454	668	8,272
Gr. Brit. and N. Ire.	35	209	686	1,019	395	661	9,672	12,145	769	13,181
Greece . . .	0	0	18	7	0	2	170	57	2	68
Hungary . . .	—	—	29	22	—	—	243	247	—	291
Italy . . .	0	0	333	399	2	9	3,269	4,484	9	5,148
Latvia . . .	—	—	—	—	(2) 0	(2) 0	(2) 51	(2) 62	0	77
Norway . . .	—	—	2	2	—	—	44	42	—	46
Netherlands . . .	0	0	73	95	4	7	875	882	7	1,027
Poland . . .	2	2	119	95	20	34	1,228	1,016	26	1,215
Portugal . . .	—	—	20	29	—	—	289	346	—	401
Sweden . . .	—	—	33	37	—	—	590	443	—	516
Switzerland . . .	0	0	35	37	0	0	522	569	0	630
Czechoslovakia . . .	13	11	161	254	132	146	2,030	2,366	170	2,701
Yugoslavia . . .	0	0	18	15	0	0	157	170	0	198
Canada . . .	—	—	86	73	—	—	926	944	—	1,043
Japan . . .	53	75	1,426	1,188	406	311	12,042	11,790	417	13,082
Algeria . . .	—	—	—	—	(2) 11	(2) 24	(2) 2	(2) 2	33	4
Totals . . .	3,259	3,145	4,661	5,023	54,728	57,146	52,302	57,518	63,554	64,567

Wool. — (Thousand lbs).

COUNTRIES	MAY				TEN MONTHS (August 1-May 31)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1931	1930	1931	1930	1930-31	1929-30	1930-31	1929-30	1929-30	1929-30
Wool. — (Thousand lbs).										
<i>Exporting Countries:</i>										
Spain . . .	—	—	—	—	(2) 2 342	(2) 5 481	(2) 5 765	(2) 2 535	8,062	5,781
Irish Free State . . .	—	—	—	—	(2) 1,361	(2) 6,788	(2) 417	(2) 670	10,240	994
Hungary . . .	—	—	64	71	2,023	4,050	1,402	1,177	10,018	1,561
Argentina . . . (a)	34,674	39,584	—	—	279,900	220,739	—	—	277,391	—
Chile . . . (b)	—	467	—	—	—	4,941	—	—	6,206	—
India . . .	—	—	—	—	(3) 36,566	(3) 15,670	—	—	20,318	—
Syria and Lebanon . . .	5,655	2,749	1,404	340	29,136	35,907	2,829	3,058	47,825	4,189
Algeria . . .	—	—	—	—	(2) 4,012	(2) 6,096	(2) 2,745	(2) 516	7,485	1,810
Egypt . . .	—	—	—	—	(2) 10,717	(2) 6,023	(2) 573	(2) 609	14,897	1,075
Tunis . . .	126	75	44	106	(3) 1,431	(3) 1,585	(3) 2	(3) 0	2,533	2
Un. of S. Africa . . . (a)	—	—	—	—	273	377	542	655	551	1,113
— (b)	—	—	—	—	(3) 213,924	(3) 222,549	(3) 33	(3) 0	288,877	0
Australia . . . (a)	33,228	70,140	368	64	(3) 2,943	(3) 4,034	(3) 476	(3) 205	7,401	293
— (b)	3,439	4,120	0	24	670,928	611,871	1,667	2,617	738,152	2,837
New Zealand . . . (a)	—	—	—	—	33,345	33,444	46	644	47,375	664
— (b)	—	—	—	—	(2) 133,221	(2) 130,413	(2) 0	(2) 11	156,771	13
<i>Importing Countries:</i>										
Germany . . . (a)	677	381	34,412	27,498	7,414	9,890	249,747	200,789	11,188	294,117
— (b)	1,281	1,027	3,091	2,348	9,648	11,947	23,539	20,402	14,096	28,609
Austria . . . (a)	9	11	2,134	1,790	216	308	11,766	12,390	368	15,655
— (b)	—	—	—	—	(2) 7,643	(2) 6,235	(2) 85,191	(2) 103,499	9,006	160,063
Belgium . . . (a)	—	—	—	—	(2) 14,894	(2) 17,937	(2) 2,864	(2) 2,663	25,948	4,943
— (b)	—	—	—	—	68	112	2,701	2,793	130	3,413
Denmark . . .	4	2	243	278	53	73	1,944	1,402	86	1,029
Finland . . .	9	0	269	203	40,464	44,225	383,259	373,336	55,931	548,920
France . . .	3,503	4,566	65,336	48,281	227,297	247,168	633,235	620,502	333,774	779,872
Gr. Britain and N. Ir.	28,113	29,502	96,177	90,280	231	342	2,247	1,724	650	2,714
Greece . . .	13	104	375	194	1,662	1,219	78,361	69,680	2,024	95,006
Italy . . . (a)	207	101	8,741	11,960	3,400	1,812	7,050	10,390	2,085	13,109
— (b)	805	203	858	1,305	514	802	1,276	1,464	908	1,585
Norway . . .	57	73	84	143	1,709	1,475	7,672	8,708	2,112	10,532
Netherlands . . . (a)	192	174	366	1,574	315	401	5,203	4,680	527	6,257
— (b)	68	20	635	855	2,035	2,723	29,663	22,212	3,338	34,743
Poland . . .	194	176	7,544	2,112	—	—	11,623	12,242	—	15,741
Sweden . . .	—	—	1,479	1,651	265	22	15,474	13,569	55	19,178
Switzerland . . .	44	2	2,445	2,445	1,202	1,532	26,235	27,633	2,273	36,149
Czechoslovakia . . .	218	148	5,613	5,223	24	42	7,196	4,634	84	6,676
Yugoslavia . . .	0	0	639	1,290	1,272	4,131	9,935	7,747	6,161	9,778
Japan . . .	123	218	1,634	849	1,556	1,603	113,503	175,700	2,017	203,631
United States . . .	547	9	14,167	15,483	42	24	98,232	62,151	24	100,980
Algeria . . .	31	0	4	9,412	—	—	—	—	—	—
Totals . . .	118,552	154,928	248,176	224,463	1,775,886	1,686,319	1,863,522	1,775,318	2,161,959	2,421,459

a = Wool, greasy; b = Wool, scoured.

See notes page 418.

COUNTRIES	MAY		ELEVEN MONTHS (July 1-May 31)		TWELVE MONTHS (July 1- June 30)	COUNTRIES	MAY		ELEVEN MONTHS (July 1-May 31)		TWELVE MONTHS (July 1- June 30)
	1931	1930	1930-31	1929-30	1929-30		1931	1930	1930-31	1929-30	1929-30
Coffee. (Thousand lbs.).						Tea. (Thousand lbs.).					
EXPORTS.						EXPORTS.					
<i>Exporting Countries:</i>			(2)	(2)		<i>Exporting Countries:</i>					
Brazil			1,930,215	1,733,589	1,995,631	Ceylon	24,626	26,006	220,271	227,394	251,286
India	1,702	5,520	22,148	27,886	31,698	India	6,072	10,406	329,072	350,132	370,146
Java and Madura .	2,006	3,391	35,100	52,783	55,618	Java and Madura .	14,436	14,006	144,880	142,737	154,532
						Japan	2,156	1,098	21,785	22,280	24,835
<i>Importing Countries:</i>						<i>Importing Countries:</i>					
Germany	121	71	1,204	448	470	Belgium	2	2	20	24	26
Belgium	780	49	4,345	948	1,041	Irish Free State .	..	..	(2) 168 (2)	170	196
France	0	0	60	20	22	France	0	4	33	55	57
Netherlands	1,523	1,627	17,110	19,882	21,268	Gr. Brit. and N. Ir.	5,941	7,961	80,412	80,164	95,771
Portugal	55	44	511	514	571	Netherlands	13	7	104	49	53
Switzerland	79	37	368	205	227	United States . . .	31	0	443	498	542
Canada	4	7	51	73	79	Syria and Lebanon .	..	..	(2) 13 (2)	26	20
United States	1,967	591	20,829	15,144	16,151	Algeria . . . . .	..	..	(2) 20 (2)	18	18
Ceylon	0	33	227	628	719	Union of S. Africa .	..	..	(3) 51 (3)	62	70
Syria and Lebanon . .	..	..	(2) 53 (2)	77	82	Australia	33	146	758	1,479	1,702
Australia	2	2	40	60	62	New Zealand . . . .	..	..	(3) 88 (3)	71	73
Totals	—	—	—	—	2,123,639	Totals	53,319	59,636	798,117	840,159	899,395
IMPORTS.						IMPORTS.					
<i>Importing Countries:</i>						<i>Importing Countries:</i>					
Germany	27,959	17,369	328,962	296,430	313,803	Germany	913	494	12,081	12,412	12,807
Austria	1,812	1,726	10,038	18,365	20,064	Austria	62	62	1,168	1,171	1,228
Belgium	11,640	8,561	111,02	87,575	94,862	Belgium	51	66	580	567	617
Bulgaria	100	132	1,521	1,614	1,735	Denmark	132	101	1,206	1,098	1,195
Denmark	5,666	5,309	56,820	52,660	58,513	Spain . . . . .	..	..	(2) 236 (2)	251	317
Spain . . . . .	..	..	(2) 44,366 (2)	43,048	54,788	Estonia	13	13	132	139	148
Estonia	26	11	230	269	238	Irish Free State . .	..	..	(2) 21,281 (2)	20,011	23,310
Irish Free State . . .	..	..	(2) 472 (2)	370	468	Finland	18	24	245	200	278
Finland	3,007	3,732	37,263	35,351	38,614	France	260	223	3,254	3,064	3,305
France	30,486	35,261	386,200	354,240	385,618	Gr. Britain and N.	..	..	..	..	..
Gr. Britain and N.	..	..	..	..	..	Ireland	25,283	29,648	510,793	528,185	558,356
Ireland	2,908	3,541	34,494	33,189	36,099	Greece	31	31	611	560	584
Greece	1,204	1,155	11,969	11,396	12,452	Hungary	31	15	613	693	714
Hungary	1,224	714	6,093	7,239	8,128	Italy	26	24	295	304	337
Italy	8,923	8,331	90,738	94,038	102,637	Latvia . . . . .	..	..	(2) 141 (2)	181	203
Latvia . . . . .	..	..	(2) 315 (2)	237	335	Lithuania	13	13	165	165	174
Lithuania	33	13	454	401	423	Norway	20	31	351	348	375
Norway	3,254	3,111	34,434	31,905	34,335	Netherlands	2,234	2,006	29,566	27,163	29,366
Netherlands	7,681	9,522	92,773	92,475	98,986	Poland	320	368	4,273	4,189	4,434
Poland	1,453	1,601	16,127	16,499	17,668	Portugal	42	51	556	624	686
Portugal	880	926	10,441	9,118	9,978	Rumania . . . . .	..	..	(1) 725 (1)	364	1,116
Rumania . . . . .	..	..	(1) 6,779 (1)	6,887	9,905	Sweden	71	71	855	814	877
Sweden	9,334	9,365	91,541	91,781	99,182	Switzerland	165	123	1,592	1,442	1,567
Switzerland	3,858	3,380	28,651	28,678	31,017	Czechoslovakia . .	88	66	1,409	1,340	1,396
Czechoslovakia . . .	2,661	2,815	29,242	27,935	31,458	Yugoslavia	35	24	606	747	776
Yugoslavia	1,936	1,215	19,374	20,406	21,713	Canada	2,650	10,258	42,104	42,073	43,767
Canada	4,881	3,150	30,922	25,982	29,013	United States . . .	4,136	4,711	80,200	79,812	86,369
United States	183,774	120,726	1,591,668	1,428,781	1,562,080	Chile . . . . .	..	..	(3) 3,845 (3)	3,882	5,121
Chile . . . . .	..	..	(3) 7,174 (3)	9,412	12,597	Syria and Lebanon .	..	..	(2) 335 (2)	309	315
Ceylon	150	225	2,974	2,906	3,150	Turkey . . . . .	..	..	(3) 1,634 (3)	1,623	2,030
Japan	390	430	4,004	3,660	4,004	Algeria . . . . .	..	..	(2) 2,480 (2)	2,141	2,524
Syria and Lebanon . .	..	..	(2) 2,271 (2)	2,094	2,504	Egypt . . . . .	..	..	(3) 8,710 (3)	14,189	14,978
Turkey . . . . .	..	..	(3) 9,564 (3)	9,804	12,577	Tunis	289	311	2,612	2,912	3,144
Algeria . . . . .	..	..	(2) 25,576 (2)	22,011	26,353	Union of S. Africa .	..	..	(3) 10,221 (3)	8,609	11,061
Egypt . . . . .	..	..	(3) 9,776 (3)	26,489	27,661	Australia	2,683	4,469	42,876	46,487	50,784
Tunis	328	183	2,767	3,131	3,470	New Zealand . . . .	..	..	(3) 10,296 (3)	9,883	12,461
Un. of S. Africa . .	..	..	(3) 25,111 (3)	23,819	30,353						
Australia	141	580	2,280	4,054	4,235						
New Zealand . . . .	..	..	(3) 302 (3)	284	450						
<i>Exporting Countries:</i>						<i>Exporting Countries:</i>					
India	137	223	4,054	6,400	6,658	India	467	681	5,836	9,427	9,828
						Java and Madura . .	..	..	(2) 10,371 (2)	12,890	14,917
Totals	318,318	243,807	3,156,026	2,931,101	3,208,487	Totals	40,692	54,482	814,233	835,846	899,495

(1) (2) (3) See notes page 418.

COUNTRIES	MAY		EIGHT MONTHS (Oct. 1- May 31)		TWELVE MONTHS (Oct. 1- Sept. 30)	COUNTRIES	MAY		TEN MONTHS (August 1-May 31)		TWELVE MONTHS (August 1 July 31)
	1931	1930	1930-31	1929-30	1929-30		1931	1930	1930-31	1929-30	1929-1930
Cacao. (Thousand lbs)						Total Wheat and Flour (*) (Thousand centals).					
EXPORTS.						a) NET EXPORTS					
<i>Exporting Countries:</i>						<i>Exporting Countries:</i>					
Grenada	661	593	6,757	7,796	9,074	Bulgaria	871	0	2,593	(4)	(4)
Dominican Republ.	7,109	6,889	21,720	24,055	42,500	Spain . . . . .	...	(2)	73	(4)	(4)
Brazil . . . . .	...	(2)	91,801	(2)119,050	162,486	France	(4)	516	(4)	(4)	(4)
Ecuador	3,144	7,624	25,642	28,409	39,399	Hungary	551	1,539	9,076	15,876	17,494
Trinidad	7,639	3,953	43,363	40,733	54,492	Lithuania	7	15	558	81	62
Venezuela	3,307	3,906	28,204	22,798	38,773	Poland	180	29	2,288	121	117
Ceylon	461	646	6,029	6,321	8,446	Rumania . . . . .	...	(1)	6,912	(1)	467
Java and Madura	143	123	1,288	970	2,833	U. R. S. S. . . . .	...	...	(2)61,893	(2)63,305	(6)
Cameroon	331	333	22,049	20,419	24,654	Yugoslavia	13	403	2,956	12,096	13,719
Ivory Coast	2,146	2,930	43,978	40,519	47,638	Canada	18,955	9,542	132,342	83,816	110,881
Gold Coast	22,117	31,445	429,883	399,241	507,506	United States	5,207	5,218	50,111	67,049	83,081
Nigeria	3,968	6,792	109,444	107,319	116,634	Argentina	10,271	5,128	57,239	82,056	90,761
St. Thomas and Principe	3,406	2,191	17,767	25,263	32,860	Chile . . . . .	...	(3)	651	(3)	176
Togoland	220	280	11,385	13,647	14,357	British India	(4)	11	(4)	(4)	300
						Turkey . . . . .	...	(3)	209	(4)	(4)
						Algeria . . . . .	...	(2)	5,038	(2)	2,072
						Tunis	(4)	71	1,183	2,784	3,468
						Australia	9,568	3,686	72,951	31,002	36,689
Totals	56,962	68,896	872,372	873,073	1,122,593	Totals	45,633	26,158	406,578	302,601	366,568
IMPORTS.						b) NET IMPORTS.					
<i>Importing Countries:</i>						<i>Importing Countries:</i>					
Germany	0	0	432	216	216	Germany	1,307	1,321	13,437	25,554	28,744
Belgium	66	97	406	194	304	Austria	902	873	6,764	8,122	11,407
France	0	0	228	37	37	Belgium	1,658	2,070	21,773	20,840	25,406
Netherlands	873	428	8,250	8,849	10,970	Bulgaria	(5)	(5)	(5)	888	855
Poland	0	0	0	13	13	Denmark	712	344	5,351	3,800	4,634
Czechoslovakia	0	0	13	20	20	Spain . . . . .	...	(3)	(2)	2,061	2,053
United States	811	602	5,811	5,972	8,955	Estonia	20	46	414	593	705
Australia	0	4	37	203	276	Irish Free State . . . . .	...	(2)	8,002	7,833	10,291
						Finland	212	262	2,482	2,749	3,320
						France	3,192	(5)	24,729	11,091	6,508
						Gr. Brit. and N. Ir.	9,544	10,064	110,000	102,436	122,013
						Greece	1,437	899	11,599	10,882	12,998
						Italy	4,947	4,685	40,477	16,870	25,102
						Latvia . . . . .	...	(2)	783	(2)	1,060
						Norway	406	322	4,109	3,435	4,048
						Netherlands	1,384	1,422	17,619	14,370	18,115
						Portugal	99	284	509	2,674	3,935
						Sweden	212	322	2,074	3,655	4,365
						Switzerland	(6)	699	(6)	668	(6)
						Czechoslovakia	602	778	8,761	6,925	7,921
						Ceylon	33	33	485	478	575
						India	202	(5)	2,392	2,099	(5)
						Indochina . . . . .	...	(2)	450	(2)	540
						Japan	1,534	880	8,483	7,101	8,356
						Java and Madura . . . . .	...	(2)	972	(2)	1,105
						Syria and Lebanon . . . . .	...	(2)	84	(2)	815
						Turkey . . . . .	...	(5)	(5)	(4)	496
						Egypt . . . . .	...	(5)	(3)	3,918	(3)
						Tunis	11	(5)	(5)	(5)	(5)
						Union of South Afr. . . . .	...	(3)	1,482	(3)	1,944
						New Zealand . . . . .	...	(3)	276	(3)	101
Totals	112,315	75,283	830,463	756,763	1,082,667	Totals	29,132	25,273	308,617	273,261	325,941

(*) Flour reduced to grain on the basis of the coefficient: 1,000 centals of flour = 1,333.33 centals of grain.

(a) Excess of exports over imports. — (b) Excess of imports over exports.

(1) Data up to 28th February. — (2) Data up to 30th April. — (3) Data up to 31st March. — (4) See Net Imports — (5) See Net Exports. — (6) Wheat only.

STOCKS

STOCKS OF CEREALS AND POTATOES IN FARMERS' HANDS IN GERMANY, ON JUNE, 15.

PRODUCTS	% Stocks· total production				
	15-VI-31	15-V-31	15-IV 31	15-VI-30	15-VI-29
Winter wheat	2.8	4.7	8.7	3.3	6.7
Spring wheat	3.5	6.9	13.9	3.0	9.1
Winter rye	6.7	11.7	13.2	11.3	10.9
Winter barley	2.9	4.9	7.4	6.1	4.3
Spring barley	2.5	4.2	3.6	4.7	6.0
Oats	14.8	21.3	32.0	15.9	18.8
Potatoes	3.8	8.6	21.9	5.7	5.6

Authority: *Preisberichtstelle beim Deutschen Landwirtschaftsrat*

WHEAT IN FARMERS' HANDS IN THE UNITED STATES ON JULY 1ST: 1931 = bushels 32,000,000 (centals 19,000,000); 1930 = bushels 46,834,000 (centals 28,100,000); 1929 = bushel 44,741,000 (centals 26,845,000).

VISIBLE SUPPLY OF CEREALS IN CANADA AND THE UNITED STATES (1)

PRODUCTS AND COUNTRIES	27-VI-31	30-V-31	2-V-31	28-VI-30	29-VI-29	27-VI-31	30-V-31	2-V-31	28-VI-30	29-VI-29
	1000 centals					1000 bushels				
WHEAT:										
Canada	73,392	82,116	90,450	79,312	70,949	122,320	136,860	160,750	132,187	118,249
United States	120,238	123,716	123,877	67,653	57,410	200,396	206,193	206,462	112,755	95,684
TOTAL	193,630	205,832	220,327	146,965	128,359	322,716	343,053	367,212	244,942	213,933
RYE:										
United States	5,152	5,499	5,822	6,845	3,918	9,200	9,820	10,397	12,223	6,997
OATS:										
Canada . . . . .	...	...	...	2,924	5,369	...	...	...	9,138	6,778
United States (2) . . . . .	...	...	...	3,621	2,506	...	...	...	11,317	13,114
TOTAL	5,547	6,046	8,564	6,545	7,965	17,333	20,789	26,763	20,455	24,892
BARLEY:										
Canada . . . . .	...	...	...	10,931	5,670	...	...	...	22,772	11,812
United States (2) . . . . .	...	...	...	2,242	2,751	...	...	...	4,671	5,781
TOTAL . . . . .	...	...	...	13,173	8,421	...	...	...	27,443	17,543
MAIZE:										
United States (2)	4,360	6,830	11,019	4,132	7,802	7,785	12,286	19,676	7,378	13,932

Authority: *Bradstreet's* (for rye: *Grain, Seed and Oil Reporter*).

(1) Grain stored at principal interior and seaboard points of accumulation and grain in transit by canals and lakes. — (2) East of Rocky Mountains.

GRAIN AND FLOUR STOCKS AT THE PORTS OF GREAT BRITAIN AND IRELAND (1).

PRODUCTS	1-VII-31	1-VI-31	1-V-31	1-VII-30	1-VII-29	1-VII-31	1-VI-31	1-V-31	1-VII-30	1-VII-29
	1000 centals					1000 bushels				
WHEAT:										
Grain	3,360	3,624	5,400	3,216	4,320	5,600	6,040	9,000	5,360	7,200
Flour as grain	624	720	552	624	576	1,040	1,200	920	1,640	960
TOTAL	3,984	4,344	5,952	3,840	4,896	6,640	7,240	9,920	6,400	8,160
Maize	1,584	1,968	1,560	1,488	1,971	2,829	3,514	2,786	2,657	3,520
Barley	600	460	840	920	780	1,250	968	1,750	1,917	1,625
Oats	528	512	608	328	780	1,650	1,800	1,900	2,900	2,437

Authority: *Broomhall's Corn Trade News*.

(1) Imported cereals.

STOCKS OF COTTON ON HAND IN THE UNITED STATES

LOCATION	30-VI-31	31-V-31	30-IV-31	30-VI-30	30-VI-29	30-VI-31	31-V-31	30-IV-31	30-VI-30	30-VI-29
	1000 centals					1000 bales (counting round as half bales)				
In consuming establishments . . .	5,411	6,019	6,555	6,602	6,235	1,131	1,258	1,370	1,357	1,289
In public storage and at compresses . . .	23,786	26,239	28,373	15,129	6,655	4,971	5,494	6,034	3,105	1,375
TOTAL . . .	29,197	32,308	35,428	21,731	12,890	6,102	6,752	7,404	4,462	2,664

STOCKS OF COTTON AT BOMBAY AND AT ALEXANDRIA

PORTS	2-VII-31	28-V-31	30-IV-31	3-VII-30	27-VI-29	2-VII-31	28-V-31	30-IV-31	3-VII-30	27-VI-29
	1000 centals					1000 bales (1 bale = 478 lbs.)				
Bombay (1) . . .	3,439	3,789	4,024	4,592	4,614	719	793	842	961	965
Alexandria	4,671	4,770	4,955	3,693	2,114	977	998	1,037	773	442

Authorities: *East Indian Cotton Ass.* and *Alexandria General Produce Ass.*

(1) Stocks held by exporters, dealers and mills.

STOCKS OF COTTON IN EUROPE.

COUNTRIES, PORTS, DESCRIPTIONS	2-VII-31	28-V-31	30-IV-31	3-VII-30	27-VI-29	2-VII-31	28-V-31	30-IV-31	3-VII-30	27-VI-29
	1000 centals					1000 bales (1 bale = 478 lbs.)				
<i>Great Britain</i> (1) . . .										
American . . .	2,286	2,455	2,508	1,528	2,499	478	514	525	320	523
Argentine, Brazilian, etc.	191	189	208	514	186	40	39	44	108	39
Peruvian, etc. . . .	224	225	236	241	142	47	47	49	50	30
East Indian, etc. . .	800	814	844	290	200	168	170	176	61	42
Egyptian, Sudanese	1,363	1,348	1,396	1,310	1,307	286	282	292	274	273
Other (2)	244	233	237	318	359	51	49	50	66	75
TOTAL . . .	5,113	5,264	5,429	4,201	4,693	1,070	1,101	1,136	879	982
<i>Bremen</i>										
American	1,856	2,176	2,427	1,492	1,457	388	455	508	312	305
Other	61	53	43	52	32	13	11	10	11	7
TOTAL . . .	1,917	2,229	2,475	1,544	1,489	401	466	518	323	312
<i>Le Havre:</i>										
American	1,380	1,557	1,666	743	733	285	326	346	156	153
Other	178	159	160	173	122	37	33	34	36	26
TOTAL . . .	1,558	1,716	1,826	916	855	322	359	382	192	179
<i>Total Continent</i> (3) . . .										
American	3,800	4,354	4,691	2,603	2,418	795	911	981	546	506
Argentine, Brazilian, etc.	106	107	100	63	62	22	23	21	13	13
E. Indian, Australian, etc.	223	231	244	193	143	48	48	51	42	30
Egyptian	99	101	109	102	63	21	21	23	21	13
W. Indian, W. African, E. African, etc.	57	49	52	116	77	12	10	11	24	16
TOTAL . . .	4,290	4,842	5,196	3,087	2,763	898	1,013	1,087	646	578

Authority: *Liverpool Cotton Ass.*

(1) Data for following day. — (2) Includes: W. Indian, etc.; E. African, etc.; W. African, and Australian. — (3) Includes Bremen, Havre, and other Continental ports.

MONTHLY REVIEW OF PRICES (I)

PRODUCTS, MARKETS AND DESCRIPTIONS	July 17, 1931	July 10, 1931	July 3, 1931	June 26, 1931	June 19, 1931	Average (2)			Commercial Season	
						June 1931	July 1930	July 1929	1929-30	1928-29
WHEAT										
Winnipeg: No 1 Manitoba (cents p. 60 lbs.) . .	58 ³ / ₈	58 ¹ / ₈	61 ⁷ / ₈	62	59 ⁵ / ₈	61	96	158 ⁷ / ₈	124 ³ / ₈	124
Chicago: No 2 Hard Winter (3) (cents p. 60 lbs)	52 ⁷ / ₈	53 ¹ / ₄	n. q.	n. 66	n. 77	n. 75	89	133 ⁵ / ₈	114 ¹ / ₈	119 ³ / ₄
Minneapolis. No. 1 Northern (cents p. 60 lbs.) .	64	66 ¹ / ₂	70	70	74 ³ / ₄	74 ¹ / ₈	80 ⁵ / ₈	137 ¹ / ₂	117 ¹ / ₂	115 ³ / ₄
New York No 2 Hard Winter (3) (cents p. 60 lbs)	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	95 ⁵ / ₈	145 ¹ / ₈	121 ¹ / ₈	131 ¹ / ₂
Buenos Aires (a); Barletta (80 kg. p. hectol. — pesos paper per quintal)	5.90	5.95	5.95	6.00	6.00	5.96	9.97	10.66	10.65	9.93
Karachi: Karachi white, 2 ¹ / ₂ barley, 1 ¹ / ₂ % dirt (rupees per 556 lbs.)	15-12-0	15-8-0	16-2-0	16-12-0	16-8-0	16-14-0	26-11-0	40-0-0	36-6-0	43-13-7
Berlin Home grown (Reichsmarks p. quintal) . .	25.35	25.05	25.95	27.40	27.00	27.20	28.75	24.85	25.33	21.83
Hamburg, c. i. f. (Reichsmarks p. quintal):										
No 3 Manitoba	(4) 10.98	(4) 10.90	(4) 11.40	(4) 11.82	(4) 11.15	(4) 11.09	16.80	25.84	21.30	21.59
No 2 Hardwinter	9.71	10.05	10.05	(5) 10.22	(5) 10.14	—	15.88	22.16	19.49	20.98
Barusso (79 kg p. hectol.)	8.95	9.08	9.46	9.46	9.12	9.29	(6) 16.00	21.19	18.72	19.96
Antwerp (Belgian francs p. quintal):										
Home grown . . . . .	...	100	93	96	98 ¹ / ₂	95	152 ¹ / ₂	168	154 ³ / ₄	162 ¹ / ₂
No 2 Hard Winter, Gulf . . . . .	..	(7) 96	(7) 96	(7) 94	(7) 89	(7) 92	141	n. q.	171	..
Paris: Home grown, 75-77 kg. (francs p. quintal)	169.50	178.00	179.00	191.75	100.25	168.10	155.90	169.25	139.40	155.35
London: Home grown (shillings per 504 lbs.) . .	28/6	27/6	27/-	27/6	26/-	26/4	36/6	40/5	40/10	43/6
London and Liverpool c. i. f., shipping current month (shillings p. 480 lbs.):										
South Russian (on sample)	20/3	22/-	22/3	22/9	21/6	22/1	n. q.	n. q.	n. q.	n. q.
No 3 Manitoba	21/3	21/7 ¹ / ₂	22/4 ¹ / ₂	22/3	21/8	22/-	35/8	55/3	45/2	45/6
No. 2 Hard Winter (3)	(8) 20/-	(8) 21/3	(9) 21/7 ¹ / ₂	(9) 22/4 ¹ / ₂	(9) 21/4 ¹ / ₂	21/11	33/7	47/2	41/5	43/3
White Pacific	21/-	21/6	22/3	22/-	22/9	22/9	34/4	51/6	42/3	46/-
Rosafe (63 ¹ / ₂ lbs.), afloat	(n) 19/-	(9) 19/-	(9) 19/4 ¹ / ₂	(9) 20/-	(9) 19/8	(9) 20/1	(10) 33/8	46/7	40/3	42/3
Choice White Karachi	21/3	21/6	22/6	22/7 ¹ / ₂	22/-	22/7	34/6	33/-	42/2	n. q.
Australian	21/6	22/6	22/3	22/6	22/3	22/7	36/5	40/-	43/6	45/11
Milan (b): Home grown, soft (liras p. quintal) . .	(7) 92.50	(11) 93.50	(11) 91.50	(11) 91.00	99.00	100.50	(11) 124.25	(11) 124.50	131.30	131.40
Genoa c. i. f. (shillings p. metric ton). La Plata. .	n. 86/-	n. 88/-	89/-	93/6	93/-	95/4	155/3	101/3	184/6	192/10
RYE.										
Minneapolis No 2 (cents per 56 lbs.)	37	37	38	38	35 ⁵ / ₈	38 ⁵ / ₈	54	106	80 ⁵ / ₈	99
Berlin: Home grown (Reichsmarks per quintal) . .	18.95	18.95	21.15	21.30	20.80	20.42	17.19	19.97	17.04	20.47
Hamburg c. i. f.: La Plata, 74-75 kg. (R. M. p. 100 kg.)	(12) 7.26	(12) 7.77	(12) 7.77	(12) 7.94	(12) 7.77	(12) 7.91	n. q.	18.77	14.57	19.72
Groningen (c): Home grown (florins per quintal) .	4.25	n. q.	4.25	4.37	4.12	4.30	4.68	9.45	6.33	9.74
BARLEY.										
Winnipeg: No. 4 Western (cents p. 48 lbs.) . .	31	30 ¹ / ₂	32	33 ¹ / ₈	31 ³ / ₈	31 ¹ / ₄	35 ¹ / ₈	78 ¹ / ₂	51 ⁷ / ₈	67 ⁵ / ₈
Chicago: Feeding (cents per 48 lbs.)	40	38	38	38	39	38 ³ / ₄	48	63 ³ / ₄	57 ³ / ₈	56 ³ / ₈
Berlin: Home grown, fodder (Reichsmarks per quintal)	15.50	15.80	18.50	19.05	19.80	20.36	18.14	18.49	17.40	19.78
Antwerp: Danube (francs per quintal) . . . . .	..	76	77	79 ¹ / ₂	80	79	74	150 ¹ / ₂	107 ¹ / ₂	154 ¹ / ₂
London: English malting (shillings p. 448 pounds).	n. q.	n. q.	32/6	32/6	32/6	32/6	26/6	42/6	39/-	47/8
London and Liverpool, c. i. f., parcels (shillings per 400 lbs.):										
Danubian 3 %	n. q.	n. q.	(13) 15/-	(13) 15/-	(13) 15/-	(13) 15/1	15/9	32/6	22/3	32/6
Russian (Azoff-Black sea)	(13) 14/6	(13) 14/3	(13) 14/6	(13) 15/-	(13) 15/-	(13) 15/1	15/8	n. q.	18/11	n. q.
Canadian Western, No. 4	(14) 16/-	(14) 15/9	(14) 16/3	(14) 16/3	(14) 15/10 ¹ / ₂	(14) 16/5	n. q.	33/2	n. 25/10	29/4
Californian malting (shillings p. 448 lbs.) . .	31/8	32/6	32/6	32/6	32/6	32/6	25/9	37/6	32/6	39/9
Moroccan	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	29/-	n. 24/2	29/8
Groningen (c): Home grown winter (fl. p. quintal)	5.50	n. q.	5.55	5.45	5.35	5.37	5.87	9.87	7.55	9.97

(a) Thursday prices. — (b) Saturday prices. — (c) Prices of preceding Tuesday.

(1) All quotations are, unless otherwise stated, for spots. — (2) The monthly averages are based on Friday quotations, the annual averages on the monthly. — (3) Quoted formerly as No. 2 Winter. — (4) No. 2 Manitoba. — (5) No. 1 Hard Winter. — (6) 78 Kg. per hl. — (7) No. 2 Hard Winter, Atlantic. — (8) Hard Winter on sample. — (9) 63 lbs. per bushel. — (10) 62 ¹/₂ lbs. per bushel. — (11) New crop. — (12) 72/73 kg per hectolitre. — (13) Shipping August-September. — (14) No. 3 Western.

PRODUCTS, MARKETS AND DESCRIPTION	Average (1)									
	July 17, 1931	July 10, 1931	July 3, 1931	June 26, 1931	June 19, 1931	June 1931	July 1930	July 1929	Commercial Season	
									1929-30	1928-29
OATS										
Winnipeg, No. 2 White (cents per 34 lbs.) . . .	29 3/4	29 1/4	31	30 7/8	29 1/4	30	42 3/8	62 5/8	58 1/2	58 7/8
Chicago: No. 2 White (cents per 32 lbs.) . . .	27 3/4	28 1/2	28 1/2	28 1/2	26 1/4	27 3/8	36 3/4	48 3/8	44 3/8	47 3/4
Buenos Aires (a): Current quality (pesos paper per quintal) . . .	4 00	3.95	3.90	4.00	3.85	3.86	4.01	7.41	5.30	7.71
Berlin: Home grown (Reichsmarks per quintal) .	16.40	16.30	16.05	17.00	17 05	17 64	17 12	18 36	15 62	19.08
Paris: Home grown, black and other (francs per quintal) . . .	86.25	89.25	91.50	90.25	91.75	88.60	70.55	116.10	81 15	127.85
London: Home grown white (shillings per 336 lbs.)	20/6	20/6	20/6	20/6	20/6	20/6	18/6	20/-	21/-	28/3
London and Liverpool c. i. f., parcels (shillings p. 320 lbs.):										
Danubian (39-40 lbs)	n q	n q.	n q	n. q.	n q	n. q	(2)12/6	n. q.	(2)n.16/4	n q.
Plate (f. a. q.)	11/-	10/9	11/1 1/2	11/-	10/6	10/7	11/10	23/9	16/1	23/9
White clipped American	n q	n. q.	n. q.	n. q.	n. q.	n q.	n q	25/6	n. q.	24/2
Chikan Tawny	11/6	11/6	11/6	12/-	12/-	11/11	12/7	23/4	17/3	24/2
Milan (b): spot (liras per quintal):										
Home grown	67.50	n. q.	n. 67.50	67.50	67.50	70.00	71.00	88.50	80.75	103.30
Foreign imported	63.00	62.00	62.00	62.60	60.50	61.00	62.00	89.25	74.25	98.90
MAIZE.										
Braila: Danube (lei per quintal) . . . . .	..	247	285	246	242	248	336	785	309	687
Chicago: No. 2 Mixed American (cents per 56 lbs.)	59 3/4	57 3/4	59 3/4	59	56 3/4	57	81 1/4	100 1/2	85 3/8	94 1/4
Buenos Aires (a): Yellow Plate (pesos paper per quintal)	3.85	3.80	3.80	3.80	3.80	3.82	5.80	8.42	6.17	8.35
Antwerp, spot (Belgian francs per quintal):										
Bessarabian . . . . .	..	75	74	72	74	73 1/2	90 1/2	n. q.	n. 97 1/4	n. q.
Cinquantino . . . . .	..	77	76	74	71	70 1/2	137 1/2	160	131 1/4	173
Yellow Plate . . . . .	..	63 1/2	63 1/2	62	63 1/2	63 1/2	107 1/2	156	109 1/4	155 1/4
London and Liverpool, parcels, c. i. f. (shillings per 480 lbs)										
Danube	n q	n. q.	n q	n. q.	n. q	n. q.	23/11	n. q.	24/11	n. q.
Yellow Plate	14/4 1/2	14/4 1/2	14/9	14/7 1/2	14/1 1/4	14/7	24/4	39/1	25/3	38/3
No. 2 White African	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	23/4	38/7	29/-	38/3
Milan (b): Home grown (liras per quintal) . . .	48.50	49.50	49.50	51.50	52.50	52.50	68.00	91.75	71.35	97.00
RICE (CLEANED).										
									1930	1929
Milan (b) Maratelli (lire per quintal)	108.50	112.50	110.50	112.50	116.00	115.60	165.00	210.00	152.15	195.70
Rangoon: No. 2 Burma (rupees per 7500 lbs.) .	217 1/2	212 1/2	212 1/2	212 1/2	202 1/2	207	421	484	303 3/4	402 1/4
Saigon (Indochinese piastres (3) p. quintal):										
No. 1 Round white (25 % broken)	6.18	6.01	..	5.73	5.56	5.32	11.87	11.71	11.36	11.68
No. 2 Japan (40 % broken)	5.68	5.55	5.60	5.31	5.02	5.03	11.48	11.12	10.80	11.08
London (a): c. i. f. (shillings per 112 lbs.)										
Spanish Belioch, No. 3 oiled	11/3	11/6	11/7 1/2	11/7 1/2	12/1 1/4	12/5	14/10	17/8	14/1	17/11
Italian good, No. 6 oiled	n. q.	n. q.	n. q.	15/3	15/3	15/3	15/3	19/-	14/11	18/9
American Blue Rose	18/-	18/-	18/-	17/9	18/3	18/1	23/1	23/-	21/9	21/10
Burma, No. 2	6/11 1/4	6/10 1/2	6/9 3/4	6/9 3/4	6/8 3/4	6/9	11/6	13/6	10/11	13/2
Saigon, No. 1	7/1 1/2	7/1 1/2	7/1 1/2	6/9	6/9	6/9	11/7	13/8	11/8	13/8
Siam, Garden, No. 1	7/10 1/2	7/7 1/2	7/8	7/7 1/2	7/9	7/11	16/1	n. q.	14/-	16/1
Tokio: Various qualities (yens per koku)	19.60	19.20	18.80	18.70	18.20	18.32	28.98	28.42	26.57	29.06
LENSBED.										
Buenos Aires (a): Current quality (pesos paper per quintal)	11.85	12.00	11.55	10.85	10.90	10.62	17.05	18.76	17.19	18.20
Antwerp: Plate (Belgian francs p. quintal) . .	..	170	157	145	147	144 1/2	269 3/4	305	284 1/4	318 3/4
Hull, c. i. f.: Plate (p. sterling p. l. ton) . . .	8-15-0	9-2-6	9-0-0	8-15-0	8-3-9	8-7-8	15-2-10	18-5-0	15-0-5	18-5-0
London, c. i. f.: Bombay bold (p. at. per long ton).	11-17-6	12-0-0	12-6-3	12-0-0	11-2-6	11-6-10	17-5-4	19-16-10	17-14-4	20-18-1
Duisburg: No. 1, Northern (cents p. 56 lbs.) . .	186 1/2	182	157 3/4	154 3/4	148 1/4	149 1/8	209	271 3/4	286	273 3/4

(a) Thursday prices. — (b) Saturday prices.

(1) The monthly averages are based on Friday quotations, the annual averages on the monthly. — (2) Weight not indicated. —

(3) Actual rate of change: 1 piastre = 38 3/4 ¢.

PRODUCTS, MARKETS AND DESCRIPTION	Average (1)									
	July 17, 1931	July 10, 1931	July 3, 1931	June 26, 1931	June 19, 1931	June, 1931	July, 1930	July, 1929	Commercial Season	
									1929-30	1928-29
COTTONSEED										
Alexandria . Sakellariis (pastres per ardeb) . . .	46.5	46.2	50.0	49.1	44.2	46.7	60.8	97.0	67.9	95.4
Hull: Sakellariis (p. sterl. per long ton) . . .	4-18-9	4-17-6	5-6-3	5-2-6	4-13-9	5-0-0	6-4-8	9-16-3	6-18-2	9-12-2
COTTON.										
New Orleans Middling (cents per lb)	9.06	9.10	10.16	10.21	8.72	8.91	12.72	18.76	16.17	18.98
New York Middling (cents per lb)	9.30	9.35	10.35	10.35	8.85	9.12	13.21	18.05	16.00	19.69
Bombay: M. g. Broach f. g. (rupees per 784 lbs.) .	178	177	184	190	170	175	190	323 3/4	288 1/2	346 1/4
Alexandria (a) (talariis per kantar)										
Sakellariis f. g. f.	13.42	14.42	15.12	14.62	13.07	13.47	27 3/8	32 1/4	28 3/4	35 1/4
Ashmoun (Upper Egypt) f. g. f.	9.95	10.65	11.40	11.10	9.05	10.07	19 1/4	207 1/8	10 1/2	227 1/4
Bremen Middling (U. S. cents per lb)	10.69	10.59	11.26	11.21	9.83	10.18	15.06	21.11	18.27	21.19
M. g. Broach fully good (pence per lb.)	n. 4.30	n. 4.25	n. 4.45	n. 4.55	n. 4.05	n. 4.20	n. 4.75	n. 7.70	n. 0.83	n. 8.27
Le Havre: Middling, Gulf (francs per 50 kilogr.) .	317	310	345	345	294	307	437	624	545	624
Liverpool (pence per lb)										
Middling fair	n. 6.37	n. 6.25	n. 6.68	n. 6.03	n. 5.95	n. 6.13	n. 8.93	n. 11.65	n. 10.89	n. 11.69
Middling	5.17	5.05	5.48	5.43	4.75	4.93	7.63	10.40	9.09	10.53
São Paulo, good fair	5.37	5.25	5.68	5.63	4.95	5.13	7.39	10.30	9.02	10.91
M. g. Broach, fully good	n. 4.14	n. 4.15	n. 4.41	n. 4.41	n. 3.81	n. 4.00	n. 5.06	n. 8.42	n. 6.80	n. 8.68
Sakellariis, fully good fair	7.65	7.85	8.45	8.20	7.45	7.71	12.37	16.66	14.52	13.17
BUTTER.										
									1930	1929
Copenhagen (a) (Kr. p. 100 kg)	195	195	188	183	194	192	243	290	245	303
Maastricht, auction (b): Dutch (florins p. 50 kg) .	..	139	136	134	137	135	174	190	170	200
Hamburg, auction (b): Schleswig-Holstein butter, with quality mark (R. M. per 50 kg.) . . . . .	..	123.84	121.43	122.97	124.00	123.28	149.85	166.01	146.67	178.03
Kempten (b): Allgäu butter (Pfennige p. half kg.) .	114	111	105	105	105	105	135	154	128	159
London (c) (shillings p. cwt.)										
British blended	140/-	140/-	140/-	140/-	140/-	140/-	154/-	168/8	158/8	196/-
Danish	122/-	120/-	120/-	122/-	122/-	122/-	150/-	178/2	153/0	189/6
Irish creamery, salted	120/-	118/-	118/-	118/-	118/-	118/6	142/-	175/7	134/10	179/4
Dutch	120/-	118/-	118/-	118/-	118/-	117/0	149/6	168/10	151/11	182/4
Argentine	118/-	116/-	114/-	116/-	118/-	117/-	137/8	165/2	135/10	174/1
Siberian	n. q.	n. q.	n. q.	105/-	108/-	107/0	134/9	164/5	n. 133/10	167/2
Australian, salted	114/-	112/-	112/-	114/-	116/-	115/6	142/-	172/10	135/9	176/-
New Zealand, salted	120/-	118/-	116/-	117/-	118/-	117/0	142/-	176/-	137/8	178/9
CHEESE.										
Milan (lire per quintal)										
Parmigiano-Reggiano, 1st quality of last year's production	1,175	1,175	1,175	1,150	1,150	1,140	1,287	1,037	1,160	1,074
Green Gorgonzola, mature, choice	575	575	575	585	605	610	561	765	671	820
Rome: Roman pecorino choice (lire p. quintal) . .	1,175	1,175	1,175	1,175	1,175	1,169	1,187	1,500	1,207	1,546
Alkmaar: Edam 40 + (40% butterfat, with the country's cheesemark, factory cheese, small: florins, p. 50 kg) . . . . .	..	38.00	38.00	38.50	34.50	34.50	41.12	46.37	40.88	47.10
Gouda (2): Gouda 45 + (whole milk cheese, with the country's cheesemark, home-made; florins, p. 50 kg.) . . . . .	...	41.50	41.50	40.50	39.50	38.25	46.00	52.50	45.56	52.45
Kempten (b): (Pfennige per half kg.):										
Softcheese, green (20% butterfat)	25 1/2	23 1/2	21 1/2	21 1/2	21 1/2	21 1/2	20	39	27	35
Emmenthal from the Allgäu (whole milk cheese) 1st quality	100 1/2	100 1/2	100 1/2	100 1/2	100 1/2	99 1/2 (3)	98	311 1/2 (3)	97	(3) 107
London (c) (shillings per cwt.):										
English Cheddar	102/-	102/-	102/-	104/-	104/-	104/-	90/-	102/5	103/4	121/9
Canadian	79/-	79/6	79/6	80/-	80/-	79/10	86/1	111/-	93/11	107/8
New Zealand	84/6	80/6	58/6	59/6	59/6	59/-	82/0	95/8	82/2	96/6
Liverpool (c): Engl. Cheshire, ungraded (sh. p. cwt.)	77/-	72/4	67/8	67/8	67/8	67/8	80/6	88/8	96/5	111/6

(a) Thursday prices. — (b) Wednesday prices. — (c) Average prices for weeks ending on preceding Wednesday.

(1) The monthly averages are based on Friday quotations, the annual averages on the monthly. — (2) Indicated formerly as 100-degreven. — (3) Average prices for all qualities.

QUARTERLY REVIEW OF PRICES (1)

Groups	COUNTRIES AND PRODUCTS	Average						Agricultural year (2)	
		VI	V	IV	I-III	IV-VI	IV-VI	1929-30	1928-29
		1931	1931	1931	1931	1930	1929		
GERMANY (Prices in Reichsmarks per quintal).									
A I	Wheat (Berlin)	27.20	28.51	28.80	27.30	28.69	21.97	25.00	21.50
	Rye (Berlin)	20.42	19.81	19.10	18.43	16.98	19.75	17.27	21.00
	Barley, feeding (Berlin)	20.36	23.49	22.79	20.08	17.85	18.92	17.43	19.97
	Oats (Berlin)	17.64	19.43	17.70	14.78	15.78	19.31	15.77	20.51
	Potatoes (Berlin)	5.30	4.44	4.10	2.73	3.14	4.06	3.63	5.14
A II	Milk, fresh (Berlin)	17.76	16.75	17.19	18.14	13.59	16.72	16.89	18.40
	Butter (Hamburg)	246.56	249.96	257.14	292.80	264.09	321.10	330.68	363.62
	Cheese, Emmental variety (Kempten)	199	197	197	197	199	224	205	221
	Beef (Berlin) (3)	91.55	92.80	97.00	101.35	115.75	112.80	114.84	114.20
	Veal (Berlin) (3)	96.50	109.40	124.80	110.85	133.42	135.67	143.02	137.60
	Pork (Berlin) (3)	90.00	90.80	88.20	104.91	128.48	148.73	154.09	148.20
B I	Basic slag (Aachen) (4)	0.233	0.216	0.25	0.32	0.30	0.32	0.31	0.30
	Superphosphate of lime 13 %	6.29	6.62	6.62	6.66	6.71	6.53	6.51	6.16
	Potash salts 18-22 % (4)	0.145	0.144	0.152	0.152	0.152	0.152	0.152	0.152
	Sulphate of Ammonia (4)	0.856	0.856	0.856	0.85	0.90	0.95	0.86	0.92
	Nitrate of lime (4)	1.07	1.07	1.07	1.05	1.07	1.13	1.05	1.13
B II	Wheat bran (Hamburg)	13.10	14.16	12.96	10.65	7.93	12.00	9.33	13.66
	Linseed cake (Hamburg)	13.24	13.80	13.92	15.63	17.34	21.96	21.08	23.80
	Coconut cake (Hamburg)	11.78	13.08	14.68	13.33	15.11	18.90	16.94	21.16
	Rapeseed cake (Hamburg)	n. q.	n. q.	n. q.	9.70	12.09	18.20	15.59	19.36
	Groundnut cake (Hamburg)	11.64	11.98	13.12	12.45	13.04	20.00	17.55	22.18
	Crushed soya extraction residue (Hamburg)	12.06	12.38	13.74	14.01	13.68	19.38	16.59	21.22
DENMARK (Prices in Danish crowns per quintal).									
A I	Wheat (Copenhagen)	11.50	11.62	11.12	10.40	15.78	16.15	16.08	16.71
	Rye (Copenhagen)	n. q.	n. q.	n. q.	n. 7.50	n. q.	16.00	12.80	16.48
	Barley (Copenhagen)	12.00	11.75	10.75	10.40	12.43	15.82	14.13	16.69
	Oats (Copenhagen)	14.08	13.75	10.06	11.20	11.71	16.12	18.69	17.32
A II	Butter (Copenhagen)	192	193	201	228	223	277	280	311
	Eggs	79	73	70	114	98	118	149	159
	Pork (3)	76	95	96	86	146	169	155	153
B I	Superphosphate 18 %	5.95	5.95	5.95	5.93	6.40	6.05	6.22	5.99
	Potash salts 40 %	12.95	12.95	12.95	12.95	13.30	13.30	13.05	13.44
	Sulphate of ammonia	17.65	17.65	17.65	17.53	19.10	20.10	18.55	20.10
	Nitrate of lime, Norwegian	16.85	16.85	16.85	16.82	16.95	15.50	16.47	15.90
B II	Maize, Plate (Copenhagen)	7.07	n. 8.00	8.18	7.73	10.20	16.73	13.47	17.41
	Wheat bran (Copenhagen)	9.20	10.30	10.12	9.22	9.99	14.59	11.49	16.05
	Cotton seed cake (Copenhagen)	12.50	13.05	13.82	14.11	17.19	20.92	18.96	22.06
	Sunflower seed cake (Copenhagen)	11.40	11.40	11.55	12.36	12.19	19.78	15.95	21.14
	Groundnut cake (Copenhagen)	11.65	12.22	12.95	12.35	13.18	19.90	17.27	21.37
	Crushed soya extraction residue (Copenhagen)	11.95	12.52	13.65	13.37	13.39	18.33	16.00	19.57

(1) Each quarter a list will be published for several countries of prices of products of the soil (A I) and of livestock (A II) sold by the farmer, as well as of fertilisers (B I), and of concentrated feeding stuffs for livestock (B II) bought by the farmer.

In the case where the market is not indicated, the price is the average one for the country. — The prices paid to farmers for sugar beet are generally fixed once for the year and therefore are not inserted in these tables.

. 2) July to June. — (3) Live weight. — (4) Prices per unit per quintal.

Groups	COUNTRIES AND PRODUCTS	Average						Agricultural year	
		VI	V	IV	I-III	IV-VI	IV-VI	1929-30	1928-29
		1931	1931	1931	1931	1930	1929		

FRANCE (Prices in francs per quintal).

A I	Wheat (Paris)	188.10	185.60	185.95	177.08	181.19	154.50	139.70	155.96
	Rye (Paris) (1)	n. q.	n. q.	n. q.	n. q.	n. 78.91	n. 130.65	n. 87.70	n. 130.00
	Barley (Paris) (1)	n. 89.00	n. 90.00	n. 87.75	88.52	74.25	132.60	92.59	134.86
	Oats (Paris)	88.60	90.80	89.40	78.12	68.26	129.00	90.22	130.79
	Wine, red (southern markets) (2)		150	146	154	71	134	89	154
A II	Beef (Paris) (1) (3)	936	954	902	1,042	1,031	906	910	790
	Pork (Paris) (1) (4)	n. q.	572	586	614	798	862	851	761
	Mutton (Paris) (1) (3)	1,462	1,512	1,518	1,522	1,424	1,421	1,452	1,325
B I	Basic slag 18 % (Lorraine)	23.40	23.40	23.40	25.20	25.50	26.10	25.05	24.10
	Superphosphate 14 % (North and East)	30.40	30.40	30.40	30.40	31.71	30.25	31.61	29.15
	Sylvite, minimum 12 %	10.60	10.60	10.60	10.60	10.72	10.95	10.89	10.95
	Nitrate of soda (Dunkirk)	113.00	113.30	112.50	110.00	119.50	128.00	115.71	124.83
	Sulphate of ammonia 20.4 %	n. q.	n. 115.50	115.50	114.00	120.25	122.33	118.85	122.81
B II	Linseed cake (North) (1)	85	80	85	103		138	129	145
	Coconut cake (Marseilles) (1)	73	80	80	67		128	102	129
	Groundnut cake (Marseilles) (1)	75	78	80	81		141	116	146

GREAT BRITAIN (A: Prices in shillings and pence per cwt;

B: Prices in pounds sterling, etc. per long ton).

A I	Wheat	6/3	6/-	5/6	5/3	8/8	10/-	9/8	10/-
	Barley	5/9	5/9	5/9	5/7	6/10	9/9	7/8	9/10
	Oats	7/-	6/11	6/6	6/1	6/7	10/1	7/6	10/2
	Potatoes (London)	9/-	8/6	8/9	6/11	3/1	5/2	4/-	5/10
A II	Butter (London)	140/-	140/11	144/8	140/5	158/8	88/8	177/4	205/4
	Cheese, Cheddar (London)	104/-	106/-	106/-	98/8	110/7	135/6	109/1	135/10
	Beef (London) (3)	84/-	78/2	77/-	76/3	80/4	85/2	82/10	80/6
	Mutton (London) (3)	112/-	109/8	108/6	99/9	116/8	109/8	109/8	107/4
	Pork (London) (3)	78/8	88/4	98/-	103/10	118/2	115/6	120/2	109/10
B I	Basic slag 14 % (London)	2-1-6	2-3-0	2-3-0	2-3-0	2-3-0	2-4-0	2-3-1	2-5-0
	Superphosphate, 16 % (London)	3-1-0	3-1-0	3-1-0	3-2-8	3-6-0	3-6-0	3-6-0	3-8-0
	Kaunt 14 % (London)	3-3-0	3-3-0	3-3-0	3-3-8	3-3-0	3-1-7	3-1-2	3-0-0
	Nitrate of soda, 15 1/2 % (London)	10-0-0	10-0-0	10-0-0	9-19-14	10-2-0	10-13-0	9-18-4	10-9-0
	Sulphate of ammonia 20.6 % (London)	9-10-0	9-10-0	9-10-0	9-9-4	10-2-0	10-13-0	9-18-4	10-9-0
B II	Bran, British (London)	4-5-0	5-1-6	5-8-5	4-18-11	4-0-1	6-10-5	6-13-10	7-10-0
	Bran, middlings, imported (London)	4-12-0	4-11-6	4-8-2	4-6-5	4-12-2	7-1-3	5-12-1	7-15-0
	Linseed cake, English (London)	8-11-6	8-8-3	8-17-0	9-10-1	11-7-9	13-12-4	12-19-5	13-18-0
	Cottonseed cake (London)	4-19-3	5-3-8	5-9-0	5-1-3	5-6-4	7-12-0	6-11-7	7-19-0
	Coconut cake (London)	n. q.	n. q.	n. q.	n. q.	n. q.	10-18-8	10-8-8	11-2-0
	Palm kernel cake (Liverpool)	(5) 6-1-8	n. q.	n. q.	n. q.	6-6-9	9-12-6	8-8-4	9-12-0

ITALY (Prices in lire per quintal).

A I	Wheat, soft (Milan)	100.50	112.20	106.50	105.48	138.30	133.30	131.45	131.18
	Wheat, hard (Palermo)	141	145	137	130	143	145	141	148
	Oats (Milan)	70.00	72.90	73.50	73.50	74.40	96.40	82.18	104.69
	Maize (Milan)	52.50	53.90	51.00	49.40	68.40	98.90	77.35	105.09
	Rice (Milan)	115.60	128.20	118.50	109.65	163.70	199.50	131.22	187.04
	Hemp, fibre (1)		222	214	192	n. 374	n. q.	461	524
	Olive oil (Milan)	590	602	610	611	504	740	573	816
	Wine, ordinary, 11° to 13° (Bari) (2)	110	100	115	111	131	143	136	155

(1) New series. — (2) Price per hectolitre. — (3) Dead weight. — (4) Live weight. — (5) Hull.

Groups	COUNTRIES AND PRODUCTS	Average						Agricultural year	
		VI	V	IV	I-III	IV-VI	IV-VI	1929-30	1928-29
		1931	1931	1931	1931	1930	1929		
ITALY (continued)									
A II	Cheese Reggiano (Milan)	1,140	1,112	1,112	1,104	1,177	1,050	1,128	1,136
	Eggs, fresh (Milan) (1)	4.09	3.86	4.04	5.01	4.47	5.69	6.26	7.46
	Beef (Milan) (2)	352	380	350	381	460	502	480	478
	Pork (Milan) (2)	347	376	390	414	566	716	637	722
B I	Basic slag 16-20 % (Chiasso) (3)	1.15	1.15	1.15	1.36	1.38	1.56	1.43	1.46
	Superphosphate, mineral, 15-17 % (Genoa) (3)	1.17	1.17	1.17	1.20	1.30	1.30	1.30	1.30
	Chloride of potassium (Genoa)	78.00	78.00	78.00	78.42	84.00	83.00	83.52	83.00
	Sulphate of ammonia (Genoa)	73.50	73.50	74.50	78.72	91.46	98.50	91.27	95.76
	Copper sulphate (Genoa)	167	169	169	176	223	243	223	228
B II	Wheat bran (Genoa)	37	40	41	43	47	64	58	72
	Rice bran (Milan)	37	37	37	35	47	63	57	72
	Linseed cake (Milan)	54	56	62	62	80	90	90	105
	Groundnut cake (Milan)	48	51	52	51	68	90	82	96
	Rapeseed cake (Milan)	34	37	36	32	54	77	66	74
NETHERLANDS (Prices in guilders per quintal).									
A I	Wheat (Groningen)	n. q.	6.41	6.23	5.87	9.26	10.59	9.99	10.50
	Rye (Groningen)	4.30	4.78	4.20	4.01	5.03	9.90	6.72	10.00
	Barley (Groningen)	5.37	5.48	5.10	4.63	6.72	10.03	7.93	10.25
	Oats (Groningen)	5.38	5.86	5.33	4.65	5.15	8.86	6.16	9.75
	Peas (Rotterdam) . . . . .	...	...	...	3.29	9.48	16.04	12.02	18.31
	Flax, fibre (Rotterdam) . . . . .	...	...	...	61	84	119	100	125
	Potatoes (Amsterdam) (4)	n. 4.40	n. 7.00	6.90	5.42	2.42	2.73	2.64	3.50
A II	Butter (Maastricht)	135	130	143	162	154	190	194	212
	Cheese, Gouda 45 % (Bodegraven)	71.00	72.40	71.00	73.37	83.01	89.70	100.81	108.94
	Cheese, Edam 40 % (Alkmaar)	69.50	65.40	65.24	63.37	73.41	86.62	90.09	95.66
	Eggs (Roermond) (5) . . . . .	...	...	...	5.92	5.13	6.16	7.22	8.12
	Beef (Rotterdam) (6) . . . . .	...	...	...	94	107	102	105	100
	Pork (Rotterdam) (2) . . . . .	...	...	...	45	63	86	79	77
B I	Basic slag (3)	0.118	n. 0.110	0.135	0.149	0.144	0.168	0.162	0.150
	Superphosphate 17 %	2.50	n. 2.50	n. 2.50	2.60	2.87	3.15	3.15	3.04
	Kainite (3) . . . . .	...	...	...	0.154	0.145	0.143	0.150	0.148
	Nitrate of soda	10.70	10.70	10.70	10.53	10.92	11.00	10.50	11.62
	Sulphate of ammonia 20 1/2 %	9.10	10.10	10.30	9.35	9.55	11.32	10.06	11.03
B II	Maize	5.62	6.20	5.85	4.58	7.03	10.17	8.64	11.00
	Linseed cake, Dutch	7.65	7.75	8.00	9.55	10.17	13.23	12.24	13.90
	Coconut cake	7.65	8.25	7.75	7.68	8.72	11.04	10.05	12.47
	Groundnut cake	7.25	7.20	7.50	7.07	8.02	13.04	10.95	13.68
POLAND (Prices in zlotys per quintal).									
A I	Wheat (Warsaw)	33.55	34.76	32.27	25.21	41.41	48.20	40.80	48.45
	Rye (Warsaw)	29.29	28.20	25.87	19.23	19.02	31.73	22.72	36.58
	Barley (Warsaw)	n. q.	n. q.	27.25	24.64	24.70	36.39	26.88	38.03
	Oats (Warsaw)	31.43	30.07	26.79	22.00	18.33	33.36	21.05	37.21
A II	Butter (Warsaw)	372	456	445	523	490	636	590	692
	Beef (Warsaw) (2)	85	84	86	97	119	137	131	147
	Pork (Warsaw) (2)	130	119	123	130	225	247	238	225
	Eggs (Warsaw) (7)	182	128	135	216	170	213	235	279
B I	Superphosphate (3)	0.82	0.82	0.82	0.82	0.88	0.90	0.89	0.88
	Potash salts 25 %	13.75	13.75	13.75	13.75	13.75	12.92	13.75	11.33
	Sulphate of ammonia	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.50
B II	Wheat bran (Warsaw)	17.50	n. 23.00	22.83	n. 15.50	14.67	24.95	16.04	26.46
	Rye bran (Warsaw)	17.97	n. 22.50	22.71	13.37	10.00	22.13	13.34	25.55
	Linseed cake (Warsaw)	29.75	n. 31.75	33.00	30.50	n. 34.50	n. 49.00	39.86	50.02
	Rapeseed cake (Warsaw)	25.50	26.50	23.83	n. 19.50	n. 28.00	n. 37.00	29.35	40.22

(1) Dozen. — (2) Live weight. — (3) Prices for unit per quintal. — (4) Hectolitre. — (5) 100 eggs. — (6) Dead weight. — (7) Box of 1440 eggs.

Groups	COUNTRIES AND PRODUCTS	Average						Agricultural year	
		VI	V	IV	I-III	IV-VI	IV-VI	1929-30	1928-29
		1931	1931	1931	1931	1930	1929		
SWEDEN (Prices in Swedish crowns per quintal)									
A I	Wheat	20.25	20.25	20.15	19.83	17.70	18.32	18.31	19.24
	Rye	17.25	17.25	17.15	16.50	13.46	17.08	14.92	19.35
	Barley	13.95	14.00	13.02	11.51	12.26	16.42	13.40	16.61
	Oats	11.75	12.75	12.04	9.90	9.48	13.40	10.88	15.25
A II	Beef (Goteborg) (1) . .	46	47	47	49	56	57	56	53
	Pork (Goteborg) (1) . .	52	53	55	54	100	113	108	106
	Butter (Malmo)	181	182	188	211	211	267	262	292
	Eggs (Stockholm)	70	70	73	115	130	111	151	155
B I	Superphosphate, 20 % . .	7.78	7.78	7.78	7.78	7.80	7.90	7.85	7.93
	Potash salts, 20 % . . .	7.95	7.95	7.95	7.95	8.10	8.40	8.25	8.65
	Chilsalt peter	19.04	19.04	19.04	19.04	19.04	19.95	19.38	20.25
	Calcium cyanamide . . .	18.10	18.10	18.10	18.10	18.10	18.90	18.40	19.70
B II	Maize - La Plata	8.39	8.96	9.22	8.93	12.02	17.72	14.73	18.39
	Wheat bran	9.52	10.79	10.77	10.01	9.97	14.12	11.12	14.82
	Groundnut cake	12.64	13.62	13.98	13.37	14.66	21.34	18.42	22.30
	Cottonseed cake	12.18	12.76	12.84	12.39	14.54	19.53	16.98	20.69
	Soya meal	13.52	14.16	14.71	14.10	14.73	20.32	17.37	21.14
CZECHOSLOVAKIA (Prices in Czech crowns per quintal).									
A I	Wheat	160	157	154	163	163	180	172	191
	Rye	145	149	135	101	104	154	121	178
	Barley	145	149	151	141	133	182	138	175
	Oats	147	156	149	114	102	159	117	172
	Edible potatoes	42	47	44	35	23	52	37	56
	Hops	565	685	685	659	1,565	2,346	1,496	3,401
A II	Butter	2,400	2,350	1,900	2,250	2,133	2,450	2,150	2,473
	Fresh eggs (2)	780	840	816	1,182	869	1,056	1,125	1,305
	Beef (3)	950	900	925	979	992	1,067	1,156	1,050
	Veal (3)	875	892	1,025	979	1,100	1,125	1,219	1,012
	Pork (1)	825	850	900	904	1,375	1,325	1,445	1,247
B I	Basic slag, 15 % . . . . .	...	...	39.23	38.94	40.23	39.84	40.93	38.31
	Superphosphate, 16 to 18 % . . .	...	...	51.85	51.85	56.67	60.35	53.37	59.07
	Kainite, 14 % . . . . .	...	...	23.30	23.00	23.12	23.25	23.62	23.40
	Chile saltpeter . . . . .	...	...	163.50	165.50	174.50	181.50	169.46	178.36
	Sulphate of ammonia, 20 1/2 % . .	...	...	140.00	140.00	148.50	168.00	149.04	163.29
B II	Maize	72	76	71	67	105	158	120	167
	Wheat bran (Prague)	83	91	93	81	77	118	80	130
	Rye bran (Prague)	85	92	93	80	68	118	83	130
	Crushed soya (Prague)	125	129	129	129	140	182	164	190
	Rapeseed cake (Prague)	101	101	101	92	123	169	147	175
	Linseed cake (Prague)	120	135	135	131	153	195	182	199
	Groundnut cake (Prague)	124	124	120	114	147	195	174	202

(1) Live weight. — (2) 1440 eggs. — (3) Dead weight.

IMPORT DUTIES ON CEREALS AND FLOUR, AS RULING IN EUROPE ON JULY 1ST, 1931.

I: EXPRESSED IN THE OFFICIAL CURRENCY PER METRIC QUINTAL (1)

COUNTRIES	Official currency	Wheat	Rye	Barley	Oats	Maize	Wheat flour	Rye flour
Albania	gold francs	25.00	15.00	15.00	8 00	20 00	37 50	12 00
Germany	Reichsmarks	(2) 11.25- 20 00-25 00	20.00	(3) 5 00- 18 00-20.00	16 00	(4)	42.17	42.17
Austria (5)	gold crowns	10 00	10 00	(6) 0-2.00	6.00	—	23 50	23.50
Belgium (7)	Belgian francs	—	—	—	‡ 21.00	—	(8) 4.00	(8) 4.00
Bulgaria (9)	paper levas	227	221	184	218	217	420	429
Denmark	—	—	—	—	—	—	—	—
Spain	pesetas (10)	(11) 17.00	12.00	12 00	8 00	10.00	(11) 21 00	9 00
Estonia	gold francs	(12) 0-15 00	—	—	—	—	(13) 25 00- 39.00	9.00
Irish Free State	—	—	—	—	—	—	—	—
Finland	Finmarks	100	125	100	25	—	210	(13) 145-225
France	French francs	80 00	35.00	15 00	30 00	(14) 16.80- 24.00	(15) 128 00- 160 00-185.00	70.00
Great Britain and Northern Ireland	—	—	—	—	—	—	—	—
Greece (16)	gold drachmas	10 50	8.75	8.75	8.75	(17) 8.75-10.50	18.72	(18) 17.50- 21.00
Hungary	gold crowns	6 30	5 80	5 00	4.80	2.00	13.00	12.00
Italy	liras	60.60	16.50	14.70	11.95	(17) 4.20-60.60	87.00	23.90
Latvia	lats	(19) 7.00	(19) —	3.00	3.00	—	(13)(19) 10.00- 25.00	(19)(20) 5.00- 12.00
Lithuania	litas	30.00	20.00	20 00	20.00	20.00	90 00	55.00
Norway	—	(4)	(4)	(4)	(4)	—	(4)	(4)
Netherlands	—	—	—	—	—	—	—	—
Poland (21)	zlotys	25 00	(22) 0-17 00	17.00	17.00	(23) 0-6.00	(24) 37.00	(24) 25.00
Portugal (25)	gold escudos	(26) 3.31	2.60	2 80	2.60	2.00	(26)	2.20
Rumania	paper lei	160	45	40	36	36	400	400
Sweden	crowns	(4)	(4)	3.70	—	—	(4)	(4)
Switzerland	francs	(27) 0.60	(27) 0 80	0 80	0 80	0 50	(27) 4.50	(27) 4.50
Czechoslovakia (28)	Czech crowns	55.00	68.00	53.00	38.00	(29) 6.00-18.00	121.00	121.00
Turkey	Turk. pap pounds	6.30	4.50	4.00	4.00	4.50	9.50	6.00
Yugoslavia	gold dinars	(4)	(4)	10 00	10.00	5.00	(4)	16.00

(1) The duties indicated below are those ordinarily applied. Reductions to gold francs have been made on the basis of the current quotations. All known modifications will be regularly given in subsequent numbers of the Monthly Crop Report and Agricultural Statistics. — (2) General duty R. M. 25.00 (\$64.43¢ per bushel); wheat, imported under customs control for the manufacture of wheat starch R. M. 11.25 (73.10 ¢), duty valid until 31 July 1931, R. M. 20.00 (¢. 129.66) for wheat imported under customs control for certain mills for the manufacture of flour and grs. — (3) Barley for stock-feeding, imported under customs control, R. M. 18.00 (93.56 ¢. per bushel); in the case of controlled purchase of marked rye, potato flakes and maize of the Monopoly R. M. 5.00 (25.92 ¢.); all other barley R. M. 20.00 (103.98 ¢.). — (4) Imported exclusively by the Monopoly. — (5) In addition, tax of 2 % ad valorem for whole cereals, of 7 % ad valorem for wheat flour and of 5 % ad valorem for rye flour. — (6) Barley for fodder free, other barley 6 gold crowns (8.82 ¢. per bushel). — (7) In addition, tax of 1 % ad valorem for wheat, rye, barley, maize, wheat flour and rye flour and of 2 % ad valorem for oats. — (8) Import and transit only by special licence. — (9) In the duties are included taxes, etc. to the following amounts: wheat 65 paper-levas rye 59 p.-l., barley 49 p.-l., oats 56 p.-l., maize 55 p.-l., wheat and rye flour 105 p.-l. — (10) 25 % of the duties are expressed in gold pesetas and 75 % in paper pesetas with a supplement fixed every 10 days. — (11) Import forbidden until the price of wheat is 53 pesetas (152.87 ¢. per bushel) on Castilian markets. — (12) General duty 15 gold francs: Estonian mills have the right to import, free of duty 145 kg. of wheat for each quintal of sifted flour that they export in the year following the import of the wheat. — (13) For sifted and unsifted flour respectively. — (14) Yellow, small-grained maize of Bessarabian type for stock-feeding, fr. 16.80 (16.81 ¢. per bushel); all other maize, fr. 24.00

IMPORT DUTIES ON CEREALS AND FLOUR, AS RULING IN EUROPE ON JULY, 1ST 1931

II: EXPRESSED IN AMERICAN CENTS PER BUSHEL OR BARREL (1).

COUNTRIES	Wheat (60 lbs.)	Rye (56 lbs.)	Barley (48 lbs.)	Oats (32 lbs.)	Maize (56 lbs.)	Wheat flour (196 lbs.)	Rye flour (196 lbs.)
Albania	131.29	73.52	63.02	22.41	98.03	643.30	205.86
Germany	(2) 73.10- 129.66-162.43	121.30	(3) 25.92- 98.56-103.98	55.31	(4)	893.05	893.05
Austria (5)	55.15	51.45	(6) 0-8.82	17.72	—	423.28	423.28
Belgium (7)	—	—	—	8.49	—	(8) 9.95 (8)	9.95
Bulgaria (9)	44.90	40.80	29.10	22.99	39.97	276.73	276.73
Denmark	—	—	—	—	—	—	—
Spain	(11) n. 89.54	n. 53.82	n. 50.41	n. 22.41	n. 49.01	(11) n. 360.24	154.39
Estonia	(12) 0-78.77	—	—	—	—	(13) 428.87-669.02	n. 154.39
Irish Free State . .	—	—	—	—	—	—	—
Finland	68.64	80.64	54.91	9.16	—	470.72 (9)	325.08-504.35
France	85.70	34.85	12.85	17.14	(14) 16.81-23.97	(15) 447.01-559.76- 647.25	243.76
Great Britain and Northern Ireland . .	—	—	—	—	—	—	—
Greece (16)	55.14	42.89	36.76	24.51	(17) 42.89-51.46	321.13 (18)	300.20-360.24
Hungary	34.77	19.85	22.06	14.12	10.29	234.16	216.15
Italy	36.65	22.06	16.80	9.10	(17) 5.64-80.87	406.57	111.51
Latvia	(19) 36.76 (19)	—	12.60	8.40	—	(13) (19) 171.55- 428.37	(19) (20) 85.77- 205.86
Lithuania	81.66	50.78	43.52	29.02	50.78	800.09	488.95
Norway	(4)	(4)	(4)	(4)	—	(4)	(4)
Netherlands	—	—	—	—	—	—	—
Poland (21)	76.46 (22)	0-48.52	41.59	27.73 (23)	0-17.11 (24)	369.67 (24)	249.77
Portugal (25) . . .	(26) 97.89	71.36	61.17	40.78	54.89	(26)	8.75
Rumania	25.94	6.81	5.17	3.11	5.44	211.69	211.69
Sweden	(4)	(4)	21.64	—	—	(4)	(4)
Switzerland	(27) 3.15 (27)	2.94	2.52	1.68	2.45 (27)	77.20 (27)	77.20
Czechoslovakia (28)	44.48	51.17	34.20	16.33 (29)	4.51-13.58	318.73	318.73
Turkey	* 81.40	54.26	41.34	27.56	54.26	400.90	263.20
Yugoslavia	(4)	(4)	42.01	28.01	24.50	(4)	274.48

(23.97 \$c. per bushel). — (15) For extraction tax of 70 % and over frs. 128.00 (447.91 \$c. per barrel), for extraction tax of between 70 % and 60 % frs. 160.00 (559.76 \$c. per barrel), for extraction tax of 60 % and under frs. 185.00 (647.25 \$c. per barrel) — (16) In the duties are included accessory duties corresponding to 75 % of the basic customs duties. — (17) For yellow and white maize respectively. — (18) In bags or barrels, gold drachmas 10.00 (171.55 \$c. per barrel); in boxes, gold drachmas 12.00 (205.86 \$c.). — (19) Import allowed only in conjunction with the purchase of certain quantities of cereals of home origin. — (20) Coarseground flour, lots 5.00 (85.77 \$c. per barrel); flour sifted at least in part, lots 12.00 (205.86 \$c.). — (21) In addition surtax of 10 % on customs duties. — (22) With special licence import is possible without payment of customs duties. — (23) General tariff zloty 6.00 (17.11 \$c. per bushel), horse-tooth type exempt. — (24) Import temporarily forbidden. — (25) [Besides accessory duties — (26) Limited imports for certain purposes only, the quantities being fixed each year; duty is fixed yearly; registered mills in European continental territory were authorised to import during May, June and July 450,000 q. (1,653,439 bu.) of wheat, of which not more than 300,000 q. (1,102,293 bu.) up to the end of June. — (27) Besides, in case of uncontrolled import, supplementary duties of fr. 20.00 (105.03 \$c. per bushel of wheat, 98.03 \$c. per bushel of rye, and 343.09 \$c. per barrel of flour) — (28) In addition, business tax of crowns 2.50 for wheat and barley, crowns 2.20 for rye, crowns 1.80 for oats, crowns 1.50 for maize and crowns 8.00 for flour (2.00 \$c., 1.60 \$c., 1.67 \$c., 0.78 \$c., 1.13 \$c., and 21.10 \$c. respectively per bushel or barrel). — (29) Maize for fodder crowns 6.00 (4.51 \$c. per bushel), all other maize crowns 18.00 (13.58 \$c. per bushel).

For latest modifications, see last page.

THE PRICES OF AGRICULTURAL PRODUCTS DURING THE SECOND QUARTER OF 1931

In the following pages the index-numbers of prices of agricultural products and other price indices of interest to the farmer are given as published in the different countries. The indices collected together have been obtained according to different methods and criteria in the various countries. A detailed account of the items included in each series and the system of construction of the index-numbers may be found in the volume published especially for this purpose by the Institute, entitled « Index-numbers of prices of agricultural products and other price indices of interest to the farmer ». We refer the reader to this volume for an exact interpretation of the significance of the different series of data.

Owing to the substantial divergence which often exists in the value and significance of the indices available, much care is advisable in their utilization from an international point of view. For this reason it has been considered opportune to reproduce all the data in their original form only, without attempting to formally unite them. The latter process, by a comparison of often heterogeneous data, might easily lead to the drawing of erroneous relations and conclusions.

In any case, now that most of the index-numbers for June are available, a table is given below, corresponding to those published at the ends of the preceding quarters and containing the quarterly indices.

General index-numbers of prices of agricultural products

(Base: the first quarter of 1929 = 100).

COUNTRIES	1929			1930				1931	
	2nd Quarter	3rd Quarter	4th Quarter	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	1st Quarter	2nd Quarter
Germany .	94.8	99.5	96.8	87.1	83.2	86.4	83.1	79.0	81.4
England and Wales	90.3	102.3	90.3	100.0	93.1	95.1	88.9	87.5	85.4
Estonia	92.4	93.3	89.4	80.0	71.1	69.3	64.9	64.0	64.0
Finland	96.3	90.7	87.9	82.2	77.6	76.6	69.2	60.2	...
Hungary	92.5	79.9	73.9	63.7	61.9	61.9	59.7	60.4	62.4
Italy	96.3	90.2	88.2	82.3	77.3	75.4	69.5	63.7	65.1
Netherlands . .	99.7	101.4	97.1	89.3	84.6	86.4	78.9	77.1	78.2
Poland	94.7	92.0	89.8	78.4	76.3	75.0	70.9	64.0	71.4
Argentina	92.6	101.9	98.2	89.5	83.2	83.1	66.4	60.1	59.6
Canada	96.6	100.1	106.1	99.7	92.6	78.3	68.6	61.9	60.2
Unit. Stat.: Bu- reau of Agric. Economics . . .	100.0	103.7	100.7	95.6	91.9	80.9	75.0	67.6	63.7
Unit. Stat.: Bu- reau of Labor . .	97.5	100.9	96.4	92.3	87.3	79.5	74.5	67.3	63.7
New Zealand . .	97.0	95.4	87.1	80.5	77.4	75.3	64.1	57.4	56.7

It may be observed that, during the past quarter, there has taken place a slight recovery in prices in nearly all the European countries, whereas the tendency to fall has continued in all of the five overseas countries for which index numbers are possessed.

INDEX-NUMBERS OF PRICES OF AGRICULTURAL PRODUCTS AND OF COMMODITIES BOUGHT BY THE FARMER *

COUNTRIES AND CLASSIFICATION	June	May	April	March	Febr.	Jan.	June	June	Year	
	1931	1931	1931	1931	1931	1931	1930	1929	1930 (1)	1929
GERMANY (Statistisches Reichsamt) 1913 = 100										
Foodstuffs of vegetable origin	129.8	131.8	129.7	121.0	114.1	111.6	117.8	119.6	115.3	126.3
Livestock	81.5	83.9	83.3	86.7	90.6	97.5	109.1	126.7	112.4	126.6
Livestock products	103.3	102.5	105.7	113.0	119.9	119.4	109.3	130.4	121.7	142.1
Feeding stuffs	114.5	120.0	113.9	102.7	93.0	90.9	90.2	122.4	93.2	125.9
<i>Total agricultural products</i>	107.3	109.2	108.3	106.7	105.9	106.7	109.7	124.7	113.1	130.2
Fertilizers	77.9	77.2	80.1	82.7	83.1	82.3	84.3	86.8	82.4	84.5
Agricultural dead stock	130.0	130.6	131.2	132.4	133.3	134.9	140.0	141.4	139.4	141.3
<i>General index-number</i>	112.3	113.3	113.7	113.9	114.0	115.2	124.5	135.1	124.6	137.2
ENGLAND AND WALES (Ministry of Agriculture) Average of corresponding months 1911-13 = 100										
<i>Agricultural products</i>	123	122	123	123	126	130	131	140	134	144
Feeding stuffs	82	87	88	85	77	78	92	135	96	139
Fertilizers	100	100	100	100	100	102	103	102	101	100
<i>General index-number (2)</i>	97.1	96.7	96.3	100.6	100.6	100.8	112.7	133.0	114.1	135.3
ARGENTINA (Banco de la Nación argentina) 1926 = 100.										
Cereals and linseed	54.5	54.3	51.2	53.2	54.5	53.6	89.2	89.8	82.3	100.4
Meat	93.8	89.8	93.7	94.2	94.6	91.0	117.0	110.8	110.9	113.6
Hides and skins	64.1	68.1	70.5	70.1	70.0	69.1	73.3	97.1	71.6	95.0
Wool	54.8	57.6	57.7	64.5	55.2	50.6	72.3	98.2	67.4	103.5
Dairy products	74.6	73.4	73.6	74.3	72.9	63.7	76.9	106.1	82.4	105.9
Forest products	108.7	108.7	108.7	108.7	108.7	108.7	106.9	111.8	107.9	111.5
<i>Total agricultural products</i>	62.8	62.6	61.4	63.2	63.4	61.7	91.2	95.0	85.5	102.6
CANADA (Internal Trade Branch of the Dominion Bureau of Statistics) 1926 = 100.										
Field products (grain, etc.)	47.3	48.2	47.3	44.1	45.0	42.6	79.3	83.7	70.0	93.6
Animals and animal products	73.1	76.9	81.8	84.7	87.5	92.1	98.2	108.8	102.9	112.5
<i>Total Canadian farm products</i>	56.9	58.9	60.2	59.3	60.9	61.1	86.4	93.1	82.3	100.7
Fertilizers	86.9	86.9	86.5	86.5	89.4	88.9	91.5	96.3	88.6	92.6
<i>General index-number</i>	72.2	78.0	74.5	75.1	76.0	76.7	88.0	99.4	86.6	95.6
ESTONIA (Central Bureau of Statistics) 1922 = 100.										
Commodities imported	93	91	90	81	83	86	73	91.0	83	94.6
Commodities exported	64	62	63	68	66	64	84	113.2	88	112.3
<i>Agricultural products imported and exported</i>	73	71	72	72	72	71	77	104.8	84	105.7

* For an explanation of the method of calculation of the index-numbers, reference should be made to the Institute's publication "Index-numbers of Prices of Agricultural Products and other Price-indices of interest to the Farmer" (Rome, 1930).
(1) Some data for 1930 are provisional. — (2) Calculated by the "Statist", reduced to base-year 1913 = 100.

COUNTRIES AND CLASSIFICATION	June	May	April	March	Febr.	Jan.	June	June	Year	
	1931	1931	1931	1931	1931	1931	1930	1929	1930	1929
UNITED STATES (Bureau of Agricultural Economics) Average 1909-10 to 1913-14 = 100.										
Cereals	67	74	74	74	75	77	106	111	100	121
Fruits and vegetables	114	119	120	109	109	108	133	120	158	130
Meat animals	91	99	106	106	106	112	111	163	134	150
Dairy products	86	91	99	101	101	107	118	135	123	140
Poultry and poultry products	81	77	90	92	79	110	103	140	126	159
Cotton and cottonseed	65	74	78	80	76	72	115	146	102	145
Total agricultural products	80	86	91	91	90	94	123	135	117	138
Commodities purchased by farmers (1)	61	131	134	136	137	138	150	155	116	155
Agricultural wages (1) . . . . .	...	—	—	127	—	—	(a) 100	(a) 173	152	170
UNITED STATES (Bureau of Labor) 1926 = 100										
Grains	56.0	59.6	59.5	59.3	60.4	62.4	78.7	91.0	58.3	97.4
Livestock and poultry	61.9	64.1	70.3	70.7	69.6	75.2	88.5	111.0	89.2	106.1
Other farm products	70.8	71.5	73.4	74.2	73.7	76.0	92.7	102.3	91.1	106.6
Total farm products	65.4	67.1	70.1	70.6	70.1	73.5	88.0	103.3	84.3	104.9
Agricultural implements	94.6	94.7	94.7	94.7	94.7	94.7	95.0	98.3	95.1	97.9
Fertilizer materials	79.3	80.5	80.6	80.8	81.1	81.4	85.3	92.6	85.6	92.1
Mixed fertilizers	82.4	82.8	83.5	88.3	89.1	90.4	94.1	96.7	93.6	97.2
Cattle feed	61.1	67.9	81.2	82.1	71.6	75.0	102.0	106.2	90.7	121.6
Non-agricultural commodities	71.4	72.6	74.3	75.7	77.1	78.2	86.3	91.0	85.9	94.4
General index-number	70.0	71.3	73.3	74.5	75.5	77.0	80.8	96.4	80.3	96.5
FINLAND (Central Bureau of Statistics) 1926 = 100.										
Cereals . . . . .	...	79	76	74	74	75	75	104	76	98
Potatoes . . . . .	...	63	69	73	68	68	68	211	76	148
Fodder . . . . .	...	67	71	70	62	59	67	67	62	69
Meat . . . . .	...	67	66	73	73	74	92	105	88	103
Dairy products . . . . .	...	71	73	74	75	73	77	98	84	103
Total agricultural products . . . . .	...	71	73	75	74	74	82	102	82	100
General index-number . . . . .	...	84	85	86	86	80	90	98	90	98
HUNGARY (Central Bureau of Statistics) 1913 = 100.										
Agricultural and livestock products	82	85	84	84	80	79	82	110	—	—
General index-number	91	93	93	94	92	91	94	122	—	—
ITALY (Consiglio Provinciale dell'Economia di Milano) 1913 = 100.										
National agricultural products	348.32	357.20	356.36	345.90	343.75	347.90	415.29	512.52	413.39	508.76
General index-number	339.33	347.16	353.10	356.18	357.92	361.86	412.49	480.35	411.04	480.69
NEW ZEALAND (Census and Statistics Office) Average 1909-13 = 100.										
Dairy produce	88.8	93.6	89.4	104.3	102.0	98.8	120.0	137.2	120.7	145.7
Meat	125.7	116.5	128.1	125.4	142.4	147.0	163.7	177.4	184.7	173.9
Wool	74.2	78.7	76.6	60.3	55.7	62.3	106.1	179.6	100.7	170.9
Hides, skins, and tallow	89.2	95.1	84.0	78.4	96.0	93.2	160.7	185.0	145.4	183.6
Miscellaneous	129.2	130.7	134.1	144.0	122.9	113.8	128.4	131.7	134.0	146.7
Total agricultural products	99.3	96.2	90.0	95.1	97.2	96.7	134.1	161.4	126.7	161.3

(1) 1910-14 = 100. — (2) July.

COUNTRIES AND CLASSIFICATION	June	May	April	March	Febr.	Jan.	June	June	Year	
	1930	1931	1931	1931	1931	1931	1930	1929	1930 (1)	1929
NORWAY (Kgl Selskap for Norges Vel) Average 1909-14 = 100.										
Cereals	108	107	105	104	104	102	125	166	(2) 108	(2) 155
Potatoes	165	157	167	181	181	180	120	125	(2) 152	(2) 120
Pork	76	73	74	81	84	89	102	141	(2) 106	(2) 141
Other meat	153	166	162	172	182	184	211	197	(2) 198	(2) 199
Eggs	77	83	85	124	101	107	96	108	(2) 121	(2) 135
Dairy products	126	124	133	185	138	139	151	153	(2) 150	(2) 161
Concentrated feeding stuffs	105	108	111	108	103	107	126	154	(2) 117	(2) 148
Maize	87	85	85	83	81	89	112	156	(2) 103	(2) 143
Fertilizers	96	96	96	96	96	96	105	101	(2) 101	(2) 103
NETHERLANDS (Directie van den Landbouw) Average 1924-25 to 1928-29 = 100.										
Products of the soil	71	83	78	71	66	62	45	66	(3) 98	(3) 87
Animal products	71	72	74	74	74	74	86	102	(3) 95	(3) 98
Total agricultural products	71	74	75	73	72	71	76	93	(3) 88	(3) 95
Agricultural wages	95	95	95	100	100	100	100	100	(3) 100	(3) 100
General index-number (4)	67.7	69.0	69.0	69.7	70.4	71.0	79.8	95.4	79.2	96.1
POLAND (Central Bureau of Statistics) 1927 = 100.										
Products of the soil	62.8	63.3	64.7	50.8	45.8	44.3	55.5	72.5	52.2	73.1
Products of agricultural industry	73.2	77.2	75.4	63.4	59.8	59.3	74.4	80.8	63.9	80.9
Total products of plant origin	63.3	73.1	70.3	57.1	52.6	51.5	63.7	76.6	60.6	76.9
Animals	60.7	56.2	55.9	58.0	58.9	54.9	78.2	102.3	82.3	95.4
Dairy products	57.5	65.1	61.6	74.0	80.1	83.1	76.3	89.6	81.3	102.9
Total products of animal origin	59.4	60.1	53.5	64.8	67.7	66.2	77.4	96.5	81.9	100.2
Total agricultural products	63.9	66.8	64.5	59.8	58.2	56.9	68.9	84.3	68.5	85.7
Fertilizers	118.5	124.7	124.7	124.7	124.7	124.7	126.2	130.6	121.7	126.5
Industrial products	81.2	81.0	81.3	83.4	83.9	84.1	95.2	103.6	94.2	103.3
General index-number	73.4	74.6	74.8	72.5	72.1	71.6	88.1	95.2	82.4	95.7
YUGOSLAVIA (National Bank of the Kingdom of Yugoslavia) 1926 = 100.										
Products of the soil	77.8	80.5	77.6	73.3	73.5	71.7	91.5	117.5	89.3	118.6
Animal products	71.7	73.2	75.4	77.4	78.1	82.0	93.7	109.5	96.3	107.2
Industrial products	71.7	73.0	73.9	72.6	72.1	72.8	80.5	93.1	81.8	92.6
General index-number	73.8	75.4	75.5	74.8	74.8	75.7	86.8	101.0	86.6	100.6

(1) Most data for 1930 are provisional. — (2) Agricultural year April 1-March 31. — (3) Agricultural year July 1-June 30. —

(4) Calculated by the Central Statistical Bureau of the Netherlands, reduced to the base 1925-1929 = 100.

RATES OF FREIGHT

(Rates for full cargoes).

VOYAGES						Average			Commercial Season	
	July	July	July	June	June	June	July	July		
	17, 1931	10, 1931	3, 1931	26, 1931	19, 1931					
									1929-30	1928-29
SHIPMENTS OF WHEAT AND MAIZE.										
Danube to Antwerp/Hamburg	n. 13/6	n. 13/6	n. 13/6	n. 13/6	n. 13/6	n. 13/6	14/2	17/-	15/8	n. 14/9
Black Sea to Antwerp/Hamburg	10/3	10/3	10/3	10/3	10/3	10/4	n. q.	n. q.	n. q.	n. q.
St. John to Liverpool (1)	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	1/5	3/1
Montreal to United Kingdom	1/7½	1/8	1/6	1/6	1/6	1/8	1/8	2/-	1/10	2/10
Gulf to United Kingdom	(shill. per 2/6	2/4	2/4	2/2	2/2	2/3	2/5	3/2	2/6	3/4
New York to Liverpool (1)	480 lbs.) 1/6	1/6	1/6	1/6	1/6	1/6	1/6	1/6	1/6	2/3
Northern Range to U.K. and Continent	n. 1/9	n. 1/9	n. 1/9	n. 1/9	n. 1/9	1/7½	1/9	n. q.	n. q.	1/9
North Pacific to United Kingdom (shill. per 2240 lbs.)	n. q.	n. 21/-	n. 21/-	21/-	21/-	n. 22/3	20/-	28/6	22/7	30/7
Vancouver to Yokohama (1) (dollars p. sh. ton)	2.60	2.60	2.60	2.75	2.75	2.80	2.50	3.00	2.78	3.85
La Plata Down River (2) to U.K./Continent	15/-	15/-	15/9	16/-	16/6	16/3	13/5	23/7	12/8	22/1
La Plata Up River (3) to U. K./Continent	(shill. per 16/6	16/9	17/6	18/-	18/3	17/11	15/6	25/3	14/4	23/7
Karachi to U. K./Continent (4)	19/3	19/3	19/3	19/3	19/3	10/-	15/10	n. 17/7	n. 15/4	22/-
Western Australia to U.K./Continent	26/-	26/-	26/3	26/6	27/3	27/3	25/-	27/3	25/7	38/7
									1930	1929
SHIPMENTS OF RICE.										
Saigon to Europe	(shill. per 24/-	23/10	23/10	24/-	25/-	25/7	n. 10/6	n. 22/-	n. 18/11	n. 26/1
Burma to U.K./Continent	2240 lbs.) n. q.	n. q.	n. q.	21/3	n. q.	21/10	n. q.	20/11	n. 17/8	n. q.

(1) Rates for parcels by liners. — (2) "Down River", includes the ports Buenos Aires and La Plata. — (3) "Up River", includes the ports on the Paraná River as far as San Lorenzo. Cargoes from ports beyond San Lorenzo (Colastine, Santa-Fé and Paraná) are subject to an extra rate of freight — (4) The original data being quoted in "scale terms", 10 % is added to arrive at freights per 2,240 lbs.

IMPORT DUTIES ON CEREALS AND FLOUR

CHANGES

TO BE MADE IN THE DUTIES PUBLISHED ON PAGE 428 OF THIS CROP REPORT.

COUNTRY	PRODUCT	Date when enforced	Original data per metric quintal	Data in Amer. cents per bushel or barrel
Italy	Wheat flour	8 July 1931	liras 92.90	434.13
Czechoslovakia	Rye	9 July 1931	Cz. cr. 59.00	38.05
.	Barley . . . . .	. . . . .	. . . . .	24.52
.	Wheat and rye flour . . . . .	. . . . .	. . . . .	304.00

Prof. ALESSANDRO BRIZI, Segretario Generale dell'Istituto, Direttore responsabile.

MONTHLY CROP REPORT

AND AGRICULTURAL STATISTICS

The following notes refer to crop conditions quoted in the crop reports and in the tables. — *Crop condition according to the system of the country: Germany, Austria, Hungary, Luxemburg and Czechoslovakia: 1 = excellent, 2 = good, 3 = average, 4 = bad, 5 = very bad; France: 100 = excellent, 70 = good, 60 = fairly good, 50 = average, 30 = bad; Lithuania, Poland, Sweden and Switzerland: 5 = excellent, 4 = good, 3 = average, 2 = bad, 1 = very bad; Netherlands: 90 = excellent, 70 = good, 60 = fairly good, 50 = below average; U. S. S. R.: 5 = good, 4 = above the average, 3 = average, 2 = below average, 1 = bad; United States: 100 = crop condition which promises a normal yield. — For other countries the system of the Institute is employed: 100 = crop condition which promises a yield equal to the average of the last ten years.*

CEREALS

In the majority of Europe countries July and the first half of August were rather unfavourable to ripening and harvesting of cereals. The drought continued in those countries, Italy, Spain, southern France, Hungary, Austria and Czechoslovakia, that had already suffered from it and was accompanied by high temperatures, which induced premature ripening and prevented filling out of the grain. In central and northern France, the British Isles, the Scandinavian and Baltic lands and some parts of Germany there were, on the other hand, persistent rains, often stormy in character, which caused extensive laying and also some damage to crops already cut. The estimates of production in European countries so far available represent in all a little more than half of the total European production and are included in the following table.

Production in Europe.

Crops	1931	1930	1929	1928	1927	1926	1925
(Million centals).							
Wheat (14 countries) . .	425	430	398	433	379	371	399
Rye (13 countries) . . .	243	261	273	275	233	227	272
Barley (15 countries) . .	212	231	247	219	193	201	194
Oats (12 countries) . . .	255	245	299	276	250	264	239
(Million bushels).							
Wheat (14 countries) . .	709	716	663	722	631	618	664
Rye (13 countries) . . .	434	468	487	492	416	406	485
Barley (15 countries) . .	442	480	515	457	408	419	405
Oats (12 countries) . . .	796	765	936	863	781	824	746

Amongst the countries not included in these totals are France and Italy, for which a good crop in comparison with last year's poor production is expected. On the other hand it is to be expected that some of the provisional estimates included in the above totals may undergo some reduction as the damage suffered since they were made is ascertained. Although on the whole the generally favourable forecasts made last month concerning European wheat production are somewhat cut down, it is still probable that it will be in the vicinity of 840 million centals (1,400 million bushels), a slight increase on the 823 million (1,370 million) of last year.

Cereals production.

COUNTRY	ENGLISH WEIGHTS			AMERICAN WEIGHTS			% 1931	
	1931	1930	Average 1925 to 1929	1931	1930	Average 1925 to 1929	1930 = 100	Average = 100
	Thousand centals			Thousand bushels			%	%
WHEAT								
Germany	100,077	83,531	71,859	166,792	139,216	119,763	119.8	139.3
Austria w)	5,719	6,963	6,504	9,331	11,605	10,340	82.1	87.9
Belgium	9,034	7,942	8,879	15,056	13,236	14,799	113.7	101.7
Bulgaria	34,238	34,391	24,285	57,082	57,317	40,474	99.6	141.0
Spain	87,205	87,596	87,379	145,339	145,991	145,628	99.6	99.8
Finland	673	726	601	1,121	1,210	1,002	92.7	111.9
Engl. and Wales	22,624	23,972	29,677	37,707	39,954	49,460	94.4	76.2
Hungary	38,702	50,604	47,726	64,593	84,338	79,542	76.5	81.1
Luxemburg	272	265	344	454	442	573	102.6	79.2
Malta	166	182	175	277	303	292	91.6	94.0
Netherlands	4,861	3,634	3,623	8,102	6,056	6,037	133.8	134.2
Rumania	67,453	78,464	63,319	112,419	130,770	105,530	86.0	106.5
Switzerland (1)	3,565	3,202	3,357	5,941	5,337	5,595	111.3	106.2
Yugoslavia	50,848	48,197	48,593	84,746	80,326	80,986	105.5	104.6
Totals	425,437	429,669	396,221	709,050	716,101	660,521	99.0	107.3
Canada (2)	138,880	238,723	258,428	231,480	397,872	430,704	58.2	63.7
United States w)	465,108	367,200	323,462	775,180	612,000	547,427	126.7	141.6
Mexico s)	71,041	150,600	161,816	118,402	251,000	274,637	47.2	43.1
	9,099	6,868	6,456	15,165	11,446	10,780	132.5	140.9
Totals	684,137	763,391	753,163	1,140,227	1,272,318	1,263,578	89.6	90.2
Corea	5,370	5,391	5,605	8,951	8,985	9,342	99.6	95.8
India	208,365	234,506	191,654	347,275	390,843	319,424	88.9	108.7
Japan	17,714	17,723	17,817	29,522	29,538	29,995	99.9	99.4
Totals	231,449	257,620	215,076	385,748	429,366	358,461	89.3	107.6
Algeria	13,228	19,350	17,790	22,046	32,249	29,649	68.4	74.4
French Morocco	21,034	12,782	16,553	35,139	21,302	27,588	165.0	127.4
Tripolitania	46	11	69	77	18	115	420.0	67.2
Tunis	8,378	6,239	7,068	13,962	10,398	11,780	134.3	118.5
Totals	42,736	38,382	41,480	71,324	63,967	69,132	113.3	103.0
General totals	1,333,759	1,489,062	1,411,040	2,306,249	2,481,752	2,351,692	92.9	98.1
RYE								
Germany	157,630	169,297	167,462	281,571	302,317	299,040	93.1	94.2
Austria w)	9,590	11,165	10,803	17,125	19,937	19,291	85.9	88.8
Belgium	11,835	10,133	12,206	21,135	18,630	21,797	113.4	97.0
Bulgaria	7,218	7,087	4,104	12,889	12,620	7,329	102.1	175.0
Spain	12,609	11,580	13,132	22,338	20,079	23,450	108.0	95.3
Finland	7,444	7,893	7,013	13,293	14,104	12,522	94.2	106.2
Hungary	11,920	15,907	16,836	21,287	23,406	30,064	74.0	70.8
Italy	3,609	3,431	3,649	6,446	6,127	6,516	105.2	98.9
Luxemburg	212	269	206	378	480	367	78.8	103.0
Netherlands	7,097	8,340	8,866	12,673	14,892	15,832	85.1	80.0
Rumania	8,472	10,241	5,971	15,129	18,288	10,662	82.7	141.9
Switzerland	800	848	912	1,429	1,514	1,629	94.4	87.7
Yugoslavia	4,548	4,382	4,143	8,121	7,825	7,407	103.8	109.6
Totals	242,934	260,878	255,308	433,814	465,819	455,906	93.1	95.2
Canada (2)	4,469	12,330	7,245	7,980	22,018	12,987	36.2	61.7
United States	20,272	26,963	25,832	36,200	48,149	46,126	75.2	78.5
Totals	24,741	39,293	33,077	44,180	70,167	59,066	63.0	74.3
General totals	267,675	300,151	288,385	477,994	535,986	514,972	89.2	92.8

Cereals production.

COUNTRY	ENGLISH WEIGHTS			AMERICAN WEIGHTS			% 1931	
	1931	1930	Average 1925 to 1929	1931	1930	Average 1925 to 1929	1930 = 100	Average = 100
	Thousand cents			Thousand bushels			%	%
BARI.FY								
Germany	69,576	63,058	63,172	144,952	131,373	131,611	110.3	110.1
Austria	5,140	5,893	5,237	10,720	12,278	10,911	87.3	98.3
Belgium	1,030	1,836	1,894	3,396	3,825	3,947	88.8	86.1
Bulgaria	8,739	9,537	5,858	18,207	19,869	12,204	91.6	149.2
Spain	43,128	43,625	44,892	89,851	101,096	98,527	83.9	96.1
Finland	2,967	2,987	3,086	6,182	6,223	6,429	99.3	96.2
Engl. and Wales	17,674	16,503	21,524	36,820	34,382	44,843	107.1	82.1
Hungary	9,431	13,250	13,118	19,649	27,605	27,330	71.2	71.9
Italia	5,525	5,377	5,416	11,511	11,202	11,285	102.8	102.0
Luxemburg . . .	107	99	112	224	206	233	108.7	95.9
Malta (3) . . .	137	142	138	285	295	288	96.8	99.0
Netherlands . .	1,832	1,939	1,916	3,817	4,040	3,992	94.5	95.6
Rumana	37,611	52,279	36,233	78,358	108,916	75,487	71.9	103.8
Switzerland . .	295	265	267	615	551	556	111.7	110.7
Yugoslavia . . .	8,184	8,915	8,342	17,051	18,574	17,379	91.8	98.1
Totals	211,982	230,605	211,905	441,638	480,435	440,022	91.9	100.4
Canada	(2) 36,075	64,877	50,183	(2) 75,157	135,180	101,550	55.6	71.9
United States . .	106,080	160,786	127,201	221,000	334,071	285,006	66.0	83.4
Totals	142,155	225,663	177,384	296,157	470,131	386,556	63.0	80.1
Corea	19,821	10,127	17,066	40,877	39,849	36,805	102.6	111.1
Japan	35,040	34,786	40,696	73,001	72,472	34,755	100.7	86.1
Totals	54,661	53,913	58,362	113,878	112,321	121,590	101.4	93.7
Algeria	11,244	18,327	16,661	23,425	38,133	34,712	61.3	67.5
French Morocco .	24,283	17,995	21,933	50,591	37,491	45,695	134.9	110.7
Tripolitania . .	551	165	642	1,148	344	1,338	333.3	85.8
Tunis	3,068	2,646	4,195	8,288	5,512	8,741	150.0	94.6
Totals	40,046	39,133	43,431	83,432	81,530	90,486	102.3	92.2
General totals . .	448,844	549,314	490,382	935,105	1,144,417	1,021,654	81.7	91.5
OATS								
Germany	145,005	124,702	143,803	453,138	389,690	449,664	116.8	100.8
Bulgaria	2,998	2,437	2,332	9,370	7,616	7,287	123.0	123.6
Spain	14,056	16,854	12,360	43,924	52,670	40,188	83.4	109.3
Finland	12,909	13,267	12,933	40,342	41,458	40,415	97.3	99.8
Engl. and Wales	28,470	30,036	32,202	88,970	93,863	100,632	94.8	88.4
Hungary	3,320	5,760	8,236	10,375	17,999	25,734	57.6	40.3
Italia	13,947	11,783	13,793	43,584	36,821	43,103	118.4	101.1
Luxemburg . . .	880	880	971	2,740	2,750	3,035	100.0	90.6
Netherlands . .	6,905	6,545	7,332	21,578	20,454	22,913	105.5	94.2
Rumania	19,363	25,497	22,518	60,510	70,679	70,368	75.9	86.0
Switzerland . .	851	810	928	2,659	2,532	2,900	105.0	91.7
Yugoslavia . . .	6,111	6,283	7,548	19,098	19,634	23,586	97.3	81.0
Totals	254,815	244,854	265,545	796,297	765,166	829,895	104.1	96.0
Canada	(2) 100,120	143,870	133,308	(2) 312,876	449,595	416,528	69.6	75.1
United States . .	874,400	434,577	421,428	1,170,000	1,358,052	1,316,953	86.2	88.6
Totals	474,520	578,447	554,736	1,482,876	1,807,647	1,732,536	82.0	85.5
Algeria	2,601	5,300	4,118	8,130	16,561	12,869	49.1	63.2
French Morocco .	815	754	559	2,547	2,357	1,747	108.0	145.8
Tunis	1,036	661	825	3,288	2,067	2,577	166.7	126.7
Totals	4,452	6,715	5,502	13,915	20,985	17,193	66.3	80.9
General totals . .	733,781	830,016	825,783	2,293,088	2,592,798	2,580,554	88.4	88.9

w) Winter wheat. — s) Spring wheat. — (i) Including spelt and meslin. — (2) Figures calculated on the basis of area and crop condition on July 1. — (3) Including meslin.

As regards barley and rye the forecast of a crop rather less than that of 1930 seems, on the other hand, to be confirmed, while as regards oats production should still be slightly superior to that of last year.

For the U. S. S. R. official information is wanting but judging from crop condition at the beginning of July and from the course of the weather in that month and in the first half of August, characterised by scanty precipitation and high temperatures in the areas where spring crops predominate, prospects should be good for winter crops and less satisfactory for spring crops. Since spring wheat accounts for about two-thirds of the total, the crop as whole may, despite the increase in area cultivated, be rather less than that obtained in 1930.

Production in North America (1).

Crops	1931	1930	1929	1928	1927	1926	1925
(million centals)							
Wheat (2)	684	763	675	896	822	749	640
Rye (3)	25	39	31	32	41	30	31
Barley (3)	142	226	194	237	174	137	144
Oats (3)	475	578	480	614	528	520	618
(million bushels)							
Wheat (2)	1,140	1,272	1,125	1,493	1,370	1,249	1,081
Rye (3)	44	70	55	58	74	53	56
Barley (3)	296	470	405	494	363	285	301
Oats (3)	1,483	1,808	1,529	1,920	1,650	1,654	1,915

(1) For Canada production figures have been calculated on the basis of areas, crop conditions and average yield per acre for the last ten years. — (2) Canada, United States and Mexico. — (3) Canada and the United States.

As regards North America threshing results for winter wheat in the United States are better than forecast last month; the production estimate published by the Government at the beginning of August is 36 million centals (62 million bushels) above that of July. On the other hand crop forecasts for spring cereals are further diminished in the United States and remain almost the same in Canada. Total production of wheat in North America in 1931, on the basis of crop condition on 1 August as shown in the following table, is estimated to be 79 million centals (132 million bushels) less than in 1930 and 74 million (123 million) less than the average for 1925-29.

Production in Asia.

Crops	1931	1930	1929	1928	1927	1926	1925
(million centals)							
Wheat (3 countries) . . .	231	258	216	198	224	218	223
Barley (2 countries) . . .	55	54	57	56	57	60	63
(million bushels)							
Wheat (3 countries) . . .	386	429	380	330	373	363	371
Barley (2 countries) . . .	114	112	118	116	118	125	132

The data relating to production in Asia have undergone only slight modification and production, though inferior to that of last year, may accordingly be considered as equivalent to a good average.

Production in North Africa.

Crops	1931	1930	1929	1928	1927	1926	1925
(million centals)							
Wheat (4 countries) . .	43	38	46	43	37	37	44
Barley (4 countries) . .	40	39	48	48	38	34	48
Oats (3 countries) . . .	4	7	7	6	4	4	6
(million bushels)							
Wheat (4 countries) . .	71	64	77	72	61	62	73
Barley (4 countries) . .	83	82	99	101	80	70	101
Oats (3 countries) . . .	14	21	22	19	14	12	20

For North Africa the provisional estimates have, on the other hand, been subjected to fairly considerable modifications, due to the ascertainment, as threshing proceeded, of severe losses in Algeria owing to the drought and heat during the ripening period. In compensation for these losses there has, however, been a good production in Morocco and Tunisia so that, on the whole, North Africa has had a better crop than last year.

Assembling all the data known to date regarding cereal production in the northern hemisphere the following totals are obtained, relating for wheat to roughly four-fifths of the total for that hemisphere, excluding the U S S. R., and for rye, barley and oats to two-thirds.

Totals at present known for the production of cereals in the Northern Hemisphere.

Crops	1931	1930	1929	1928	1927	1926	1925
(million centals)							
Wheat (24 countries) .	1,384	1,439	1,335	1,570	1,462	1,375	1,314
Rye (15 countries) . .	298	300	304	308	274	257	303
Barley (23 countries) .	449	549	546	560	462	432	451
Oats (17 countries) . .	734	830	796	897	782	797	858
(million bushels).							
Wheat (24 countries) . .	2,306	2,432	2,225	2,617	2,436	2,292	2,190
Rye (15 countries) . .	478	598	542	550	490	459	541
Barley (23 countries) .	835	1,144	1,138	1,167	963	899	939
Oats (17 countries) . .	2,293	2,594	2,436	2,803	2,444	2,490	2,681

These totals do not as yet give a definite idea of this year's crop results in the northern hemisphere, not only because several large producing countries are not included, but also owing to the fact that a proportion of the estimates are provisional and subject to variation. On the basis of the information in our possession it may, however, be stated that total production in the northern hemisphere will be rather smaller than that of last year for all cereals.

Regarding the southern hemisphere the information available to date indicates that there will be a considerable reduction in the area devoted to cereals and that the output will, owing to the not entirely favourable course of the weather, be very much lower than last year.

The general market situation has been influenced so far not so much by the forecasts of a rather smaller production as by the existence of heavy stocks, especially of

wheat. Recent estimates of these stocks allow the quantity of old crop existing in the four great wheat exporting countries at the opening of the season to be estimated fairly closely ; to these have been added the quantities afloat at the same date. Stocks in the United States as estimated on 1 July have been carried forward to August, the quantity exported in July being subtracted ; to ensure comparability some modifications based on approximate calculations have also been made to the data for the years previous to 1930. For Argentina and Australia the data refer to the quantities exportable on 1 August

Stocks of wheat on 1 August (including flour expressed in terms of grain)

	1926	1927	1928	1929	1930	1931
Million centals						
United States	57	76	84	157	178	204
Canada	24	34	55	77	77	84
Argentina	29	30	41	61	21	36
Australia	7	17	16	17	24	20
Quantity afloat	23	28	27	22	24	23
Totals . . .	140	185	228	334	324	367
Million bushels						
United States (1)	96	127	140	261	297	340
Canada (2)	40	56	91	127	128	139
Argentina	48	49	68	102	36	60
Australia	12	28	27	29	39	33
Quantity afloat	39	46	45	37	39	38
Totals . . .	235	306	371	556	539	610

Total stocks on 1 August are thus very large in comparison with those at the same date in the two preceding years, which represented the maxima till then attained. It must however, be remembered that stocks existing in importing countries, though we have not even approximate estimates of their magnitude, seem to have been reduced this year to minimum proportions and that it should not, therefore, be very far from the truth to assume that world wheat stocks at the beginning of the 1931-32 season are not very different from those existing at the beginning of each of the two preceding years.

When account is taken of the smaller world production this year it may be expected that a fairly considerable reduction in these stocks should occur in the season just begun.

Germany : July weather was dry, then rainy and again dry and was in general favourable to development. However, toward the middle of the month violent storms hindered field work in some places and were prejudicial to crop prospects, especially as regards quality, owing to the damage caused by laying.

(1) Including domestic wheat in store in Canada.

(2) Including domestic wheat in store in U. S. A.

The area cultivated to spelt is estimated at 272,000 acres against 293,000 in 1930 and 301,000, the average for 1925-29; percentages 92.6 and 90.3. Production is reckoned at 3,214,000 centals against 3,048,000 and 3,262,000; 105.5 % and 98.5 %.

Austria : Up to mid-July weather on the lowlands of the north and east was warm with frequent dry winds which accentuated the effects of the drought. At the end of the month more plentiful rains fell and temperature was lowered.

Cereals have matured very rapidly and almost at the same time throughout the lowlands, harvesting being thus hastened. Winter wheat has headed normally but the grain often leaves much to be desired owing to its premature ripening. Unit yields will also be lower because of the rather thin sowings. Winter rye has ripened prematurely only on permeable lands in the lowlands; the quantity of straw is very small. Winter barley has generally a satisfactory grain; early varieties have matured fairly satisfactorily despite the exceptional rapidity with which the process has occurred. Straw of spring barley and oats is extremely short.

Belgium : The beginning of July was fine and frequent rain storms favoured growth though they hindered the bringing in of the last hay, and on the whole the weather was favourable to agriculture. Winter barley was brought in and threshing was begun; the grain is good and yield normal. Rye has been cut in large part; yield varies much according to the greater or less density of the stand but is satisfactory on the whole. Harvesting of early wheat and oats was begun; for wheat the crop will be almost normal, while for oats a yield below the average is expected. Harvesting is generally easy, the grain being laid only slightly or not at all.

Bulgaria : In the latter half of July abundant rains fell. Harvesting was completed and threshing is in full swing.

Denmark : Owing to the heavy rains cereals, especially barley in Jutland, were often laid. If, however, weather remains dry a normal production may still be hoped for. Oats appear to have supported the downpours relatively well.

Estonia : The first half of July was more favourable than usual to development. Spring crops had therefore, a more favourable appearance than last year. Condition of winter crops was, on the other hand, worse than had been expected after the melting of the snow. Crop condition of rye is a little below the ten-year average, though that of barley, of oats and of mixed grain is equal to or above the average.

Irish Free State : From the beginning of the second week of July rain was general in all districts and temperatures were rather low for the season. Crops have, however, generally made satisfactory growth and, except on wet and cold soils, promise good yields of straw and grain.

Finland : Area cultivated to mixed grain in 1931 is estimated at 23,500 acres against 30,900 in 1930. Percentage 76.0. Production is expected to be 272,000 centals (469,000 bushels), against 379,000 (654,000) in 1929. Percentage 71.8.

France : July was exceptionally rainy over the greater part of the country but very dry in the south. In the latter area harvesting was completed by the end of the month.

Area and Crop Condition.

COUNTRIES	AREA SOWN §					CROP CONDITION (†)												
	1930-31	1929-30	Average	% 1930-31		I-VIII-1931			I-VII-1931			I-VIII-1930						
			to 1928-29	1929-30 = 100	Aver = 100	a)	b)	c)	a)	b)	c)	a)	b)	c)				
															Thousand acres			
WHEAT																		
Germany. . . { w	4,632	3,997	3,705	116.4	125.5	...	...	...	2.6	—	—	2.7	—	—	—	—	—
{ s	703	405	370	173.6	189.8	...	...	...	2.7	—	—	2.9	—	—	—	—	—
Austria . . . { w	486	458	475	100.0	102.3	2.9	...	...	2.6	—	—	2.3	—	—	—	—	—
{ s	...	22	29	...	...	...	3.0	...	2.7	—	—	2.6	—	—	—	—	—
Belgium . . . { w	389	412	388	94.5	100.3	...	...	...	...	f)	—	—	—	—	—	—	—
Bulgaria . . . { w	2,869	3,006	2,662	95.5	107.8	145	...	...	145	—	—	145	—	—	—	—	—
*Denmark . . . { w	...	249	247	...	...	...	...	97	...	(r) 98	—	...	100	—	—	—	—
Spain { w	10,872	10,531	10,743	103.2	101.2	...	...	...	...	(2) 99	—	(2) 99	(2) 115	—	—	—	—
*Estonia { w	...	90	66	...	...	...	...	...	...	(2) 99	—	(2) 99	e) f)	—	—	—	—
Finland { w	47	51	43	92.7	110.0	c) f)	...	...	...	f)	—	...	e) f)	—	—	—	—
France { w	12,494	12,990	13,128	96.2	95.2	...	...	...	...	...	—	...	...	—	—	—	—
Engl. and Wales . { w	1,197	1,346	1,491	88.9	80.3	...	...	...	...	...	—	...	...	—	—	—	—
*Scotland . . . { w	...	54	56	...	...	...	...	95	...	100	—	...	100	—	—	—	—
Hungary { w	4,133	4,187	3,821	98.5	107.9	...	...	...	...	...	—	...	...	—	—	—	—
Italy { w	12,029	11,896	12,156	101.1	99.0	...	...	...	...	...	—	...	...	—	—	—	—
*Latvia { w	...	179	139	...	...	...	...	80	...	...	80	120	...	—	—	—	—
Lithuania . . . { w	410	362	225	113.3	182.5	3.2	...	...	3.1	—	—	3.9	—	—	—	—	—
Luxemburg . . . { w	25	25	30	100.0	83.8	2.8	...	...	2.9	—	—	2.6	—	—	—	—	—
Malta { w	10	9	9	104.8	105.8	...	...	...	...	...	—	...	...	—	—	—	—
Netherlands . . { w	191	142	135	134.4	141.1	(2) 71	...	...	(2) 70	—	—	(2) 72	—	—	—	—	—
Poland { w	3,844	3,714	3,099	103.5	124.1	...	...	...	3.6	—	—	3.7	—	—	—	—	—
Rumania { w	6,342	6,873	7,054	92.3	89.9	...	...	...	d)	—	—	...	—	—	—	—	—
{ s	686	679	692	101.1	99.2	...	...	...	f)	—	—	...	—	—	—	—	—
*Sweden { w	...	646	488	...	...	...	...	...	...	...	...	3.7	—	—	—	—	—
Switzerland (3) . { w	179	182	171	98.4	104.6	...	...	...	98	...	100	...	87	—	—	—	—
Czechoslovakia { w	1,904	1,911	1,769	99.7	107.6	...	...	...	3.3	...	3.0	2.7	—	—	—	—	—
Yugoslavia . . . { s	74	64	99	115.6	74.8	...	...	...	2.9	—	—	...	3.1	—	—	—	—
{ w	5,239	5,212	4,545	100.5	115.3	d)	...	...	d)	—	—	e)	—	—	—	—	—
Total Europe . . { w	63,775	63,480	66,310	100.4	103.0	...	...	...	...	...	...	...	...	...	...	...	...
U. S. S. R. . . . { w	29,653	25,178	21,021	117.8	141.1	...	...	...	...	...	...	...	...	...	...	...	...
{ s	62,901	58,612	51,698	107.3	121.7	...	...	...	...	...	...	...	...	...	...	...	...
Canada (4) . . . { w	813	815	825	99.8	98.5	...	...	...	...	...	...	...	...	...	...	...	...
{ s	22,152	24,083	22,279	92.0	99.4	...	...	...	54	—	58	...	85	—	—	—	—
United States { w	40,692	39,514	38,467	103.0	111.8	...	...	...	82.3	—	—	...	...	...	...	...	...
tes (4) { s	18,977	21,006	20,684	80.8	80.9	...	...	...	39.6	—	57.9	...	...	...	...	...	...
Mexico { w	1,358	1,216	1,201	111.5	107.6	...	...	...	...	...	...	...	...	...	...	...	...
Total America . . { w	81,990	80,634	81,816	94.6	100.2	...	...	...	...	...	...	...	...	...	...	...	...
India { w	32,181	31,654	31,475	101.7	102.2	...	...	...	...	...	...	...	...	...	...	...	...
Japan { w	1,231	1,198	1,174	102.7	104.9	...	...	...	...	...	...	...	...	...	...	...	...
Syria and Lebanon { w	1,168	1,175	1,147	99.4	101.8	...	...	...	...	...	...	...	...	...	...	...	...
Total Asia . . . { w	34,680	34,027	33,796	101.6	102.3	...	...	...	...	...	...	...	...	...	...	...	...
Algeria { w	3,535	3,980	3,654	88.8	96.8	...	...	...	70	—	80	...	...	...	...	...	...
Cyrenaica . . . { w	18	38	33	46.2	53.2	...	...	...	...	...	...	...	...	...	...	...	...
*Egypt { w	...	1,577	1,554	...	...	...	...	...	107	—	—	...	...	...	...	...	...
Fr. Morocco . . { w	2,731	2,957	2,632	92.4	103.8	...	...	...	...	...	...	...	...	...	...	...	...
*Tripolitania . . { w	17	12	...	140.0	...	...	...	...	...	...	...	...	...	...	...	...	...
Tunis { w	1,903	1,923	1,719	99.0	110.7	...	...	...	...	...	...	...	...	...	...	...	...
Total Africa . . { w	3,187	3,898	3,038	92.0	101.5	...	...	...	...	...	...	...	...	...	...	...	...
Argentina (5) . . { w	17,051	21,286	20,484	80.1	83.2	...	...	...	...	...	...	...	...	...	...	...	...
Chili (5) { w	1,426	1,610	1,602	88.6	89.0	...	...	...	...	...	...	...	...	...	...	...	...
Grand Totals . . { m	212,009	220,935	212,546	96.0	99.8	...	...	...	...	...	...	...	...	...	...	...	...
{ n	304,563	304,720	285,265	99.9	106.8	...	...	...	...	...	...	...	...	...	...	...	...
RYE																		
Germany { w	10,610	11,463	11,416	92.6	92.9	...	...	...	2.9	—	—	2.9	—	—	—	—	—
{ s	179	179	209	100.2	85.9	...	...	...	2.9	—	—	...	...	...	...	...	...
Austria { w	886	886	892	100.0	99.3	2.8	...	...	2.7	—	—	2.5	—	—	—	—	3.3
{ s	...	41	54	...	...	...	...	2.8	2.7	—	—	2.7	—	—	—	—	—
Belgium { w	553	574	568	96.3	97.3	...	...	...	...	...	...	...	...	...	...	...	...
Bulgaria { w	622	657	481	94.7	129.5	145	...	...	145	—	—	140	—	—	—	—	—
*Denmark { w	...	369	448	...	...	...	...	97	...	(1) 96	—	101	—	—	—	—	—
Spain { w	1,544	1,448	1,637	106.7	91.5	...	...	...	...	...	...	...	...	...	...	...	...
Estonia { w	366	387	354	99.8	103.2	...	...	...	(2) 95	—	—	(2) 94	124	—	—	—	—
Finland { w	554	556	565	99.6	98.0	e) f)	...	...	f)	—	—	e) f)	—	—	—	—	—
France { w	1,745	1,906	1,970	91.5	88.6	...	...	...	...	...	...	...	...	...	...	...	...
Hungary { w	1,530	1,611	1,649	95.3	93.2	...	...	...	...	...	...	...	...	...	...	...	...
Italy { w	296	302	307	98.3	96.5	...	...	...	...	...	...	...	...	...	...	...	...
Latvia { w	...	660	627	...	...	...	...	...	60	—	—	150	—	—	—	—	—
Lithuania . . . { w	1,136	974	1,192	116.6	...	...	...	...	...	...	60	...	...	...	...	...	...
Luxemburg . . . { w	22	22	17	99.4	129.9	2.4	...	...	2.4	—	2.5	2.6	3.8	—	—	—	—

COUNTRIES	AREA SOWN §					CROP CONDITION (†)								
	1930-31	1929-30	Average 1924-25 to 1928-29	% 1930-31		I-VIII-1931			I-VII-1931			I-VIII-1930		
				1929-30	Aver. = 100	a)	b)	c)	a)	b)	c)	a)	b)	c)
			Thousand acres											
Netherlands . . .	444	475	489	93.8	90.8	—	—	(2) 65	—	—	(2) 65	—	—	(2) 68
Poland . . . (w)	14,123	14,500	13,938	87.4	101.3	—	—	—	3.1	—	—	—	3.7	—
Rumania . . .	938	968	720	97.0	180.4	—	—	—	e)	—	—	—	—	—
Switzerland . . .	46	50	49	91.7	93.5	—	—	—	—	—	—	—	—	88
Czechoslovakia . .	2,498	2,599	2,535	95.9	95.4	—	—	3.5	—	—	98	—	2.5	—
Yugoslavia . . (w)	505	519	440	97.2	114.7	d)	—	d)	—	—	—	d)	—	—
Total Europe . . .	38,592	40,054	39,478	96.4	97.8	—	—	—	—	—	—	—	—	—
U. S. S. R. . . (w)	60,191	71,157	67,004	97.2	103.3	—	—	—	—	—	—	—	—	—
— (s)	896	1,075	1,374	83.3	65.2	—	—	—	—	—	—	—	—	—
Canada (4) . . (w)	758	1,091	591	69.5	128.2	—	—	—	—	—	—	—	—	—
— (s)	292	357	203	81.8	143.8	—	—	57	—	—	—	—	—	87
United States (4) .	3,294	3,525	3,601	93.4	91.5	—	—	—	—	—	68.2	—	—	—
Total America . .	4,344	4,973	4,395	87.4	98.9	—	—	—	—	—	—	—	—	—
Argentina (7) . .	1,253	1,322	901	91.8	130.0	—	—	—	—	—	—	—	—	—
Chili (1)	7	8	7	88.7	95.2	—	—	—	—	—	—	—	—	—
Grand Total . (m)	44,196	46,357	44,731	95.3	99.7	—	—	—	—	—	—	—	—	—
— (n)	114,283	118,589	113,159	96.4	101.0	—	—	—	—	—	—	—	—	—
BARLEY														
Germany . . (w)	561	486	409	115.5	137.1	—	—	—	2.7	—	—	2.7	—	—
— (s)	3,440	3,267	3,237	105.3	104.6	—	—	—	2.6	—	—	—	3.0	—
Austria . . (w)	18	18	24	99.5	75.0	2.8	—	—	2.8	—	—	2.3	—	—
— (s)	411	411	346	100.0	118.8	—	3.0	—	2.9	—	—	2.9	—	—
Belgium	70	84	77	83.2	91.3	—	—	—	—	f)	—	—	—	—
Bulgaria	652	602	582	94.2	116.1	145	—	—	145	—	—	145	—	—
*Denmark	—	923	826	—	—	—	—	97	—	—	(1) 98	—	100	—
Spain	4,465	4,390	4,264	101.7	104.7	—	—	—	—	—	—	—	—	—
*Estonia	—	276	255	—	—	—	(2) 100	—	—	—	—	—	—	97
Irish Free State .	115	116	131	99.0	87.9	—	—	—	—	—	—	—	—	—
Finland	276	272	271	101.4	101.7	—	f)	—	f)	—	—	f)	—	—
France	1,955	1,799	1,739	103.6	112.4	—	—	—	—	—	—	—	—	—
Engl. and Wales .	1,029	1,020	1,184	100.9	88.4	—	—	—	—	—	—	—	—	—
*Scotland	—	107	121	—	—	—	100	—	—	100	—	—	100	—
Hungary	1,186	1,131	1,054	104.8	112.5	—	—	—	—	—	8.1	—	—	—
Italy	540	583	577	92.5	98.5	—	—	—	—	—	—	—	—	—
*Latvia	—	437	436	—	—	—	100	—	—	—	—	—	—	—
*Lithuania	—	529	494	—	—	3.6	—	—	3.5	—	—	—	3.0	—
Luxemburg	9	7	8	116.1	101.9	2.4	—	—	2.4	—	—	2.5	—	—
Malta (6)	7	7	6	101.4	106.0	—	—	—	—	—	—	—	—	—
Netherlands . . .	70	76	71	92.8	99.3	—	(2) 71	—	—	(2) 72	—	—	(2) 69	—
Poland . . . (w)	143	142	174	100.7	82.4	—	—	—	—	—	—	8.1	—	—
— (s)	—	2,908	2,827	—	—	—	—	—	3.2	—	—	—	—	2.9
Rumania	4,424	4,881	4,890	90.6	101.5	—	—	—	e)	—	—	—	—	90
Switzerland . . .	18	16	16	109.1	110.1	—	—	97	—	—	98	—	—	—
Czechoslovakia . .	1,759	1,673	1,766	105.1	99.6	—	—	3.1	2.9	—	—	—	3.0	—
Yugoslavia . . (w)	611	632	556	96.6	109.8	d)	—	d)	—	—	—	e)	—	—
Total Europe . . .	21,759	21,703	20,862	100.2	104.2	—	—	—	—	—	—	—	—	—
U. S. S. R. . . (w)	1,236	1,038	1,169	119.3	105.7	—	—	—	—	—	—	—	—	—
— (s)	15,835	17,379	16,494	91.1	96.0	—	—	—	—	—	—	—	—	—
Canada	4,784	5,559	4,297	85.2	110.2	—	—	68	—	—	65	—	—	82
United States . .	12,771	12,901	10,222	99.0	124.9	—	—	35.8	—	—	70.7	—	—	76.7
Total America . .	17,555	18,460	14,519	94.3	120.6	—	—	—	—	—	—	—	—	—
Japan	2,105	2,110	2,336	99.8	90.1	—	—	—	—	—	—	—	—	—
Syria and Lebanon	818	840	706	97.4	115.9	—	—	—	—	—	—	—	—	—
Total Asia	2,923	2,950	3,042	99.1	96.1	—	—	—	—	—	—	—	—	—
Algeria	3,199	3,650	3,445	87.6	92.8	—	—	70	—	—	80	—	—	—
Cyrenaica	82	127	133	64.5	61.3	—	—	—	—	—	—	—	—	—
*Egypt	—	345	308	—	—	—	—	165	—	—	—	—	—	—
Fr. Morocco . . .	3,128	3,207	3,028	97.6	103.2	—	—	—	—	—	—	—	—	—
*Tripolitania . . .	371	247	—	150.0	—	—	—	—	—	—	—	—	—	—
Tunis	1,087	1,202	1,243	90.4	87.5	—	—	—	—	—	—	—	—	—
Total Africa . . .	7,496	8,186	7,849	91.6	95.6	—	—	—	—	—	—	—	—	—
Argentina (4) . . .	1,460	1,411	1,171	105.6	127.2	—	—	—	—	—	—	—	—	—
Grand Total . (m)	51,172	52,710	47,443	97.1	107.8	—	—	—	—	—	—	—	—	—
— (n)	68,344	71,125	65,106	95.9	104.8	—	—	—	—	—	—	—	—	—

COUNTRIES	AREA SOWN (\$)					CROP CONDITION (†)								
	1930-31	1929-30	Average 1924-25 to 1928-29	% 1930-31		I-VIII-1931			I-VII-1931			I-VIII-1930		
				1929-30 = 100	Aver. = 100	a)	b)	c)	a)	b)	c)	a)	b)	c)
OATS						a)	b)	c)	a)	b)	c)	a)	b)	c)
Germany	8,309	8,499	8,645	97.8	96.1	—	—	—	2.7	—	—	—	—	3.3
*Austria	—	772	757	—	—	—	—	3.1	—	3.0	—	—	—	3.1
*Belgium	—	674	678	—	—	—	—	—	—	f)	—	—	—	—
Bulgaria	326	345	338	94.5	96.6	140	—	—	140	—	—	160	—	—
*Denmark	—	958	1,028	—	—	—	—	98	—	—	(1) 98	102	—	—
*Estonie	—	368	357	—	—	(2) 107	—	—	—	—	—	—	—	—
Spain	1,693	1,840	1,875	92.1	90.3	—	—	—	—	—	—	—	—	—
First Free State	628	644	656	97.5	95.8	—	—	—	—	—	—	—	—	—
Finland	1,149	1,137	1,110	101.1	103.5	—	f)	—	—	f)	—	e)	—	—
France	8,632	8,634	8,623	100.6	101.1	—	—	—	—	—	—	—	—	—
Engl. and Wales	1,652	1,778	1,820	92.9	90.8	—	—	—	—	—	—	—	—	—
*Scotland	—	862	906	—	—	—	—	95	—	—	95	—	100	—
Hungary	612	608	687	100.7	89.1	—	—	—	—	—	3.9	—	—	—
Italy	1,233	1,262	1,243	97.7	99.2	—	—	—	—	—	—	—	—	—
*Latvia	—	790	740	—	—	—	—	90	—	—	—	—	—	—
*Lithuania	—	855	828	—	—	3.7	—	—	3.6	—	—	3.3	—	—
Luxemburg	70	70	72	100.0	97.6	2.4	—	—	2.8	—	—	2.4	—	—
Netherlands	366	370	377	99.0	97.1	(2) 71	—	—	(2) 71	—	—	(2) 68	—	—
*Poland	—	5,404	5,007	—	—	—	—	—	3.1	—	—	—	—	2.6
Rumania	2,230	2,686	2,806	83.0	79.5	—	—	—	e)	—	—	—	—	—
Switzerland	45	48	50	93.9	90.6	—	100	—	—	—	96	—	—	88
Czechoslovakia	2,116	2,049	2,078	103.3	101.9	—	3.0	—	—	—	3.1	—	—	3.5
Total Europe	29,061	29,970	30,350	97.0	95.7	—	—	—	—	—	—	—	—	—
U. S. S. R.	42,497	44,242	41,419	96.1	102.6	—	—	—	—	—	—	—	—	—
Canada	13,336	13,259	12,831	100.6	103.0	—	—	71	—	—	74	—	—	92
United States	41,245	40,125	42,554	102.8	96.9	—	—	70.0	80.1	—	—	78.9	—	—
Total America	54,584	53,384	55,385	102.2	98.6	—	—	—	—	—	—	—	—	—
Syria and Lebanon	27	28	41	95.9	66.8	—	—	—	—	—	—	—	—	—
Algeria	542	638	605	84.9	89.6	—	—	70	—	—	80	110	—	—
Fr. Morocco	73	103	71	70.9	102.8	—	—	—	—	—	—	—	—	—
Tunis	99	124	104	79.6	94.7	—	—	—	—	—	—	—	—	—
Total Africa	714	865	780	82.3	91.1	—	—	—	—	—	—	—	—	—
Argentina (s)	3,484	3,978	3,387	87.6	102.9	—	—	—	—	—	—	—	—	—
Chili (s)	156	193	193	81.0	80.9	—	—	—	—	—	—	—	—	—
Grand Total . (m)	88,026	88,418	90,166	99.6	97.6	—	—	—	—	—	—	—	—	—
(n)	130,523	132,670	131,585	98.4	99.2	—	—	—	—	—	—	—	—	—

(§) See page 436 for forecast of production for the some countries. — * Countries not included in the totals. — a) above the average. — b) average. — c) below the average. — d) very good. — e) good. — f) average. — g) bad. — m) not including U. S. S. R. — n) including U. S. S. R. — (†) See explanation according to the various systems, page 435. — w) Winter crops. — s) Spring crops. — (1) Towards the middle of month. — (2) Towards the middle of preceding month. — (3) Including spelt and meslin. — (4) The area for 1931 is that which it is anticipated will be harvested: for previous years the figures refer to the area harvested. — (5) Area sown in 1931, in 1930 an in average 1925 to 1929 respectively. — (6) Including meslin.

In the south-east cereals harvested early have in general given good yields and quality of the wheat is good, dryness perfect and specific gravity high. In the south-west, on the contrary, where cereals suffered from great heat, yields of wheat vary from mediocre to average though quality and specific gravity remain good; oats are distinctly mediocre. In other regions ripening and harvesting were hindered during the last two weeks of July by bad weather. However a spell of fine weather in the last days of the month allowed cutting to be renewed and threshing to become general. In a general way yields of wheat, though very irregular, seem to be a good average; the ears are heavy but not numerous. Oats, which suffered more than wheat from the various adverse weather

conditions and which were often infested with weeds or laid, on the other hand benefited more from the rain, which enlarged the grain, and will probably give yields little below the average, especially in the case of winter oats. Yields of winter-barley appear good, those of barley only average; quality is good. Rye promises good results in the north, mediocre in the centre. On the whole the cereal crop seems, taking into account the areas sown, to be of good average quantity in the case of wheat, above the average for barley and winter-barley, average for oats, and mediocre for rye. Quality of wheat and barley appears good but the very violent storms in the first week of August, when many sheaves were still in the fields, considerably reduced dryness and specific gravity. It is also to be feared that the storms have had a bad effect on yields, especially on those of oats, much of which had not yet been cut; the damage is as yet impossible to estimate.

(*Mid-August report*): Almost incessantly bad weather over the greater part of the country has had a rather deleterious effect on the harvesting and bringing in of cereals, as well as on the first threshings, which were almost everywhere delayed. South of the Loire yields were generally average but quality is satisfactory. In the principal producing regions of the Centre, Touraine, Beauce, much wheat was still in the fields when the weather broke down; yields have caused disappointment and the greater part of the threshed grain is lacking in dryness; in some districts oats are germinating in the stacks. In the North the harvest was carried out in very bad conditions.

This situation, which was steadily aggravated and persisted up to the end of the second decade, appreciably reduced crop expectations for wheat and oats. It is scarcely possible that the amount of wheat will exceed 165 million centals (276 million bushels), a figure corresponding to a total yield equal to the average for 1925-29. The season 1931-32 commences with greatly reduced stocks in the hands of growers, dealers, millers and bakers. Prices are very firm.

Great Britain and Northern Ireland: The fine weather of the last week in June and the first few days of July was followed by very unsettled conditions with an excess of rain and very little sunshine and in some districts the month was one of the wettest on record. Temperatures were generally low for the time of year. Stormy rains caused some damage to the crops, which in many areas were laid. Crop condition indicates that the harvest will be somewhat late this year. The continued wet weather has promoted a plentiful growth of straw but the absence of sun has been unfavourable to the maturing of the grain. It appears inevitable that, even if weather should improve, the harvest will not come up to early anticipations. Harvesting, moreover, will be difficult in some districts owing to laying. Land almost everywhere in England and Wales is reported to be unusually foul with weeds, with which, owing to the unfavourable conditions, it has been difficult to cope. Wheat in England and Wales is expected in some areas to give a satisfactory unit yield but on the whole will be under average, with about 17 cwt. per acre or four-fifths cwt. below the ten-year average; much depends on the character of the soil. Barley yield in England and Wales is estimated at 15 $\frac{1}{4}$ cwt. per acre, almost equal to the ten-year average; in Northern Ireland the small area sown to this crop is in fairly good condition. Oats in England and Wales are expected to prove rather a better crop and yield per acre will probably be about 15 $\frac{1}{2}$ cwt., compared with an average of 14 $\frac{1}{2}$ cwt.; in Northern Ireland the crop is very variable and on the whole yields are expected to be below average.

Hungary: The period from 22 July to 7 August was marked by variable, but for the most part normal, temperature and by a lack of precipitation over the greater part of the country.

Harvesting of wheat is over and threshing is nearly completed. Threshing results have been disappointing owing to the frequency of premature ripening. Straw is generally scanty.

Yields of rye and barley are also relatively low. The oats crop is generally very poor quantitatively and qualitatively. Straw is scanty.

Italy : The wheat harvest was practically over in July, except in certain mountain and hill areas ; threshing, which is finished only in a few provinces, indicates a high average unit yield and a satisfactory total production, though one certainly below that of 1929. Production of other cereals is good.

Latvia : Average temperature in July was near normal. The amount and distribution of precipitation was also normal. In the first decade the weather was hot and dry, rather unfavourable to crops, while in the second it was very favourable. At the end of July there was further fine weather, warm and sunny, with little rain.

Crop condition of spring wheat on 15 July was average in 44.3 % of correspondents' replies, above average in 45.8 % and below average in 9.9 %. The corresponding figures for barley were 47.5 %, 33.0 % and 19.5 %, those for oats 41.7 %, 45.8 % and 12.5 %. The unsatisfactory condition of cereals must be attributed chiefly to the drought.

On the basis of crop condition on 15 July an estimate of total production of wheat was made, expressed in percentages of correspondents' replies ; it is considered good in 2.7 % of the replies, average in 28.4 %, under average in 37.1 % and bad in 31.8 %.

Lithuania : July weather favoured growth.

The rye harvest began in the second half of the month and was completed under good conditions.

Luxemburg . The stormy and generally rainy weather in July has retarded ripening and consequently harvesting.

Poland : In July temperatures were in the greater part of the country below the multi-annual average, but insolation and heat were sufficient, except in the north-west and, particularly, in the centre, though not soil moisture.

Rumania . In the latter half of July harvesting was completed under fairly good conditions. On the plains threshing of wheat and barley was begun, excellent results being obtained. The grain crop is qualitatively superior to that of the preceding year. Wheat has a weight of 61-63 lb. per bushel and barley 50-52 lb. per bushel.

Cereals in general are homogeneous and impurities are small.

Only in Bessarabia will the crop be poor, due to the sowings having suffered from excessive heat, wind and drought.

Switzerland : July was marked by very variable weather with frequent showers and has not been favourable to the crops. However, at the beginning of August crop condition of autumn cereals was satisfactory, though the deficit caused by the bad winter had not entirely disappeared, especially in the case of rye ; the crop, especially in the latter case, is not everywhere up to expectations, due also to the bad weather

during the harvest; wheat, which wintered better, appears satisfactory as regards quantity. Spring cereals are well developed, due to the moist warm weather; nevertheless, the effects of late sowing are felt on yields, especially in regard to straw. On the whole it is expected, as may be seen from the table, that the total cereal crop will be near the average. In respect to the average of the last ten years crop condition on 1 August was estimated as follows. Winter wheat 98 (87 in 1930) spring wheat 61 (90), spelt 101 (91), winter rye 92 (87), spring rye 99 (91), mixed grain 100 (89), winter barley 97 (92), spring barley 98 (89), oats 100 (98).

Production of spelt is estimated at 670,000 centals, 1.0 % above that of last year (664,000) and 8.1 % below the average for 1925-29 (729,000). The crop has been obtained on an area of 31,400 acres, 8.5 % below that of 1930 and 10.5 % below the average. The mixed grain crop, on the other hand, has been obtained on an area of 13,600 acres, 2.6 % above 1930 and 3.2 % above the average; it should amount to 278,000 centals (479,000 bushels), 14.5 % above that of last year (243,000, 418,000) and 3 % above the average (270,000; 465,000).

Czechoslovakia: The very hot and dry weather of July hastened ripening by ten to fourteen days. This premature ripening had in a number of districts a very deleterious effect, especially on winter cereals, which had already suffered in autumn and spring from the lack of soil moisture. It is expected that output of winter cereals will be below that previously expected, especially in the case of wheat. In certain districts of Slovakia, wheat yields vary from 1.3 to 3 centals (2.2 to 5.2 bushels) per acre. Taking cereals as a whole, barley shows the best yields.

Yugoslavia: The generally fine sunny weather of July favoured harvesting.

U. S. S. R.: In July the weather was hot. Frequent but rather poor rains fell, principally in Northern Caucasus and in Ukraina, and smaller quantities in the western and central districts of the European part of the Union. In the middle and lower Volga basin rains were rare poor and localised.

In the first week of August there were moderate rains in Ukraina, Northern Caucasus and the north-east of the European territory. The hot weather hastened ripening by about two weeks.

According to the Commissariat for Agriculture on 15 August harvesting of winter and early spring cereals took place on 153,428,000 acres, 71.4 % of the area under these cereals. The separate regions most important for cereals, have the following percentages: Crimea 99.2; Ukraina 98.4; Northern Caucasus 97.1; Lower Volga 96.5; Central Black-earth 91.1; Middle Volga 92.8; Kirghizia 80.1; White Russia 76.5.

According to the People's Commissariat for Food Supplies there was acquired last July a quantity of cereals equal to 3.4 % of the supply for the year as calculated under the Plan and 14.4 % above that fixed for July. This quantity is 2 ½ times that acquired in July last year.

Canada: In the latter part of July the drought in the Prairie Provinces was broken by showers in most areas, heaviest in northern Manitoba, southern, central and north-western Saskatchewan and central Alberta and lightest in the southwest of Manitoba and Saskatchewan and in southern Alberta. The rains came, however, too late to benefit the earlier-sown crops in a large section of the drought area, though later-sown crops improved generally.

In Saskatchewan many farmers were encouraged by the rains to resow with oats and barley many fields blown out earlier in the season.

In the last week of July there was a return to drought conditions, with almost negligible precipitation, hot winds and excessively high temperatures, which further reduced crop prospects over the main wheat area. In central and northern Alberta, however, the heat was welcome for the maturing of backward growth. The first week in August again brought cooler weather and some good rains, which helped to fill the grain, and there was a further increase in precipitation in the week ending 11 August. In the week ending 18 August warm dry weather over the Prairie Provinces helped to mature late crops in northern Alberta and Saskatchewan and harvesting became general in the following week. As a whole drought and excessive heat reduced crop conditions in July in Manitoba and Saskatchewan, while in Alberta condition was maintained. In the drought area it is considered that wheat on fallow will give a fair return but wheat on ploughed or stubbled land is thin and uneven.

Destructive hailstorms have occurred in Alberta, grasshoppers have caused damage in some areas, and stem rust is general in southern and central Manitoba and has spread to other areas, though damage was on 18 August still confined to late crops in the area named.

The winter wheat harvest was completed in the first week of August, giving high yields and good quality. Spring grain in the East was very good but drought had reduced crop prospects in eastern Ontario and western Quebec.

United States : Harvesting of winter wheat had been completed by 6 August under very good conditions throughout the winter wheat states and threshing had been almost finished. The crop is a very heavy one.

By 19 August the harvesting and threshing of spring wheat was generally completed under weather conditions fairly favourable on the whole. Much of the crop has been cut for feed or pastured. Though towards the end of July the crop was badly affected by the drought the nearly general rainfall in the south and eastern sections had by the end of that month improved its condition, though in the western section drought continued and in South Dakota damage from insect pests was reported.

Syria and Lebanon : Production is reported to be very good in the Levbanese Republic (110), good in the Syrian State (100), bad in the government of Latakia (60) General condition may be said to be 100 and total production good.

Algeria : The crop estimates published last month were made at the beginning of June. Since then successive onslaughts of the scirocco have greatly hastened ripening, causing considerable damage, which was very apparent after the harvest. The general reduction may be placed at 25 % on the previous estimate.

This year's crop will thus be the poorest since 1924, a year when the area was fixed above 3,500,000 acres for wheat and 3,200,000 for barley. That year was a very bad one but since then only 1926 can be compared with the present year.

Hard wheat will give a lower yield in 1931, barley rather better, and soft wheat distinctly better. Though the production of soft wheat with 6,063,000 centals (3,638,000 bushels) appears very much below that of last year 9,572,000 centals (5,743,000 bushels), a decrease of 36.7 % it will probably be almost equal to the five-year average, thanks to the marked expansion in area under this cereal.

The falling off in rye cultivation is notable.

The area cultivated to rye is scarcely half that of last year (44.1 %) with 2,000 acres and two thirds of the average (63.7 %). Production, at 9,000 centals (16,000 bushels), is still more reduced, 23.6 % from last year and 39.3 % from the mean.

French Morocco : There was harvested this year 8,000 centals (14,200 bushels) of rye on an area of 2,000 acres, a production approximating closely to that of last year but 18.3 % below the average, and an area 13.4 % greater than the average.

Tunisia : The production of 8,380,000 centals (13,962,000 bushels) of wheat is composed of 6,170,000 (10,288,000) hard wheat on 1,730,000 acres (a yield of 3.6 centals or 5.9 bushels per acre) and 2,200,000 (3,674,000) soft wheat on 170,000 acres (a yield of 21.3 centals or 12.8 bushels).

Union of South Africa : The winter set in earnest in the interior during June and exceptionally heavy frosts were reported from all areas. Except for local showers the weather was very dry and farming received a serious set-back during June. Although the April and May rains encouraged the ploughing of considerable areas for the winter cereal crops planting had to be delayed on account of lack of moisture. In the Cape South-western districts there were also complaints of the dry condition of the land and early rains were urgently needed throughout the Union. The insufficient rainfall during last summer is responsible for the failing of springs and the shortage of water for irrigation in many areas, more particularly in the Western districts of the Cape Province, Natal and in some parts of the Transvaal.

In the south-eastern districts of the Orange Free State the lands from which the maize crop was harvested in June were immediately prepared for wheat. All reports from this area refer to considerably increased area sown to winter cereals this season. The crops were very promising despite the dry conditions.

In July anxiety caused by the dry spell was relieved by heavy soaking rains throughout the Union, while in the eastern high-lying areas of the Cape Province heavy falls snow were reported. Conditions since the beginning of July have thus been ideal for winter cereals.

Australia. (Telegram of 14 August) · Weather has been generally very favourable for wheat. In New South Wales and Victoria sowings were delayed by the wet conditions and a decrease of 30 % in the area cultivated for next season is estimated. In Western Australia weather was generally very favourable and the crop was looking healthy and strong. In South Australia crop condition was excellent.

MAIZE

According to information received by the Institute in the first half of August, crop prospects in the northern hemisphere differ greatly according to country. The information is not, however, adequate for a sufficiently approximate estimate of production. Still, it may now be taken as certain that the United States will have a fairly abundant crop, somewhere around the average of 1925-29, that the Danubian States will have a crop on the whole considerably above that of last year, and that in the other producing countries production will be much below the average.

In the Danubian lands the crop, which began growth in April and May under excellent conditions, was in June and July on several occasions seriously threatened in some areas by the drought. For the most part, however, rains fell at the critical period and saved the crops, which had fortunately gained sufficient vigour in the initial period of growth. Only in Hungary, owing to the prolongation of the drought, were there appreciable losses.

So far only two Danubian States, Bulgaria and Hungary, have published estimates

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COUNTRIES	ENGLISH MEASURES			AMERICAN MEASURES			% 1931	
	1931	1930	Average 1925 to 1929	1931	1930	Average 1925 to 1929	1930 = 100	Average = 100
	Thousand cents			Thousand bushels			%	%
Bulgaria	17,575	17,088	14,713	31,385	30,515	20,274	102.0	119.5
Hungary	30,519	31,021	39,546	54,498	55,394	70,618	98.4	77.2
Switzerland	66	87	84	118	156	150	75.9	78.5
United States . . .	704,954	531,783	701,250	1,554,160	1,172,380	1,546,016	132.6	100.5
French Morocco . .	2,178	3,354	2,973	3,889	5,990	5,809	64.0	73.2

for the present season ; according to these estimates the crop in these two countries will be only 48.1 million centals (85.8 million bushels), as last year, when production was poor, and as against 54.2 million (96.8 million) on the average of 1925-29. The decrease is due to Hungary. The two major Danubian producers, Rumania and Yugoslavia, have not yet communicated production estimates for the current year ; nor has the latter published data for area sown. It may, however, be assumed, given the relative constancy of the area cultivated for maize in Yugoslavia in recent years, that there will not be any very great variation with respect to last year. For Rumania the official estimate of area is 7 % below the very high figure of 1930 and 4 % below the average for 1925-29. However, owing to the prevalently favourable weather, unit yields in that country will certainly be above those of last year, when there were serious losses through drought, and total production should be considerably above that of 1930, which was 99.6 million centals (177.9 million bushels) ; private estimates raise it to about 121.3 million (216.5 million).

Amongst the other European countries the three most important producers, Italy, France and Spain, have experienced very adverse weather, especially in the last two months. Drought has seriously damaged the maize fields in most parts of these countries so that their total production will be very low, especially as the Italian crop is expected to be very poor.

Maize prices in July and in the first two weeks of August were extremely low. In the middle of August they were exactly half those quoted for the corresponding period last year and were more than one-third less than those of 1913.

Prices of La Plata Amarillo Maize at Liverpool-London

(Shillings per 480 lb.) (1).

MONTHS	1913	1927	1928	1929	1930	1931
August (average)	22/8	32/5	36/1	36/10	24/11	... ..
5th Friday in August	23/7		35/6	35/6	24/-	—
1st " " " " " " " " " "	23/4	33/4	34/10	36/3	24/9	... ..
3rd " " " " " " " " " "	21/10	32/3	35/6	36/9	26/-	... ..
and " " " " " " " " " "	22/-	34/6	37/3	37/-	36/6	22/7 ¹ / ₂
1st " " " " " " " " " "	22/6	31/7	37/3	38/9	23/9	19/1 ¹ / ₂
July	22/6	29/11	39/8	39/1	24/4	14/3 ¹ / ₄
June	22/10	30/-	38/7	35/3	24/8	14/7
May	24/1	30/7	40/2	34/5	24/10	15/9
April	24/11	29/5	37/5	39/-	27/5	18/8
March	24/7	28/9	40/5	41/8	24/7	18/2
February	25/-	29/4	40/5	42/10	25/1	15/4
January	24/3	29/10	37/3	41/7	26/4	14/3

(x) Friday quotations.

* * *

Albania : The crop appears to be compromised and the Government has abolished the import duty.

Austria : At the end of July the crop was developing fairly well. On the stony lands of the Vienna basin and in the north of the Burgenland the plants were low. Heading is satisfactory.

Bulgaria : In the latter half of July rains greatly assisted development.

France : The crops have suffered greatly from drought in the southwest, where the harvest seems to be in danger. In the other regions appearance is good. On the whole only a low average can be relied on.

Hungary : Owing to the drought ear and grain formation is defective. Sterility is frequent.

Italy : The crop has suffered from the drought and will be a poor one.

Rumania : The rains in the last days of July improved crop condition, which had greatly fallen in Bessarabia and northwestern Transylvania.

Switzerland : July, though rainy and changeable, did not change the condition of the crop, which remains good and still gives promise of production almost equal (99 %) to the average of the last ten years.

Yugoslavia : Hot sunny weather prevailed in July. Rains of brief duration but abundant in amount fell in the first week of the month and were very favourable. The strong heat in the two following weeks, however, had a very adverse effect on crop condition and appearance of the crop was considerably improved only by the rains in the last week of the month.

Chile : Production in 1930-31 is estimated at 1,516,000 centals (2,707,000 bushels) against 1,314,000 (2,346,000) in 1929-30 and 1,087,000 (1,940,000) in the preceding quinquennium; percentages 115.4 and 139.5.

United States : Rainfall in the Corn Belt at the critical period of growth in the latter part of July was only partial and serious damage was caused in the north-western states by the lack of rain, especially as subsoil moisture was very deficient owing to the long-continued deficiency in precipitation. On 19 August, however, it was reported that crop condition was fairly satisfactory.

The increase in acreage this year has been quite general over the country, sowing conditions having been favourable and labour plentiful. The increase was especially marked in the South Central States, due to the reduction in cotton area, and in the Western States, where there has for several years been an upward trend.

Indo-China : The crop has suffered from the drought. In Tonkin early sowings are poorly developed. In Annam winter varieties have given good yields in the north

Maize.

COUNTRIES	AREA				CROP CONDITION (†)											
	1931	1930	Average 1925 to 1929	% 1931		I-VIII-1931			I-VII-1931			I-VIII-1930				
				1930 = 100	Aver = 100	a)	b)	c)	a)	b)	c)	a)	b)	c)		
Thousand acres																
Austria . . . . .	...	143	146	...	...	2.5	—	—	2.3	—	—	2.5	—	—		
Bulgaria	1,705	1,689	1,671	101.0	102.0	120	—	—	120	—	—	140	—	—		
Hungary	2,735	2,657	2,681	102.9	102.0	—	3.0	—	—	—	—	—	—	—	3.5	
Italy (1)	3,429	3,488	3,541	98.3	96.8	—	—	—	—	—	—	—	—	—	—	
Rumania	10,178	10,939	10,606	93.0	96.0	—	—	—	—	—	—	—	—	—	—	
Switzerland	3	3	3	76.9	76.4	—	—	99	—	—	99	—	100	—	—	
Czechoslovakia	368	364	344	101.2	107.0	—	—	—	—	—	—	—	—	—	—	
U. S. S. R.	9,742	9,632	8,399	100.6	116.0	—	—	—	—	—	—	—	—	—	—	
Canada	164	161	174	101.9	94.1	...	...	—	—	99	—	—	—	—	99	
United States	105,557	101,413	99,570	104.1	106.0	—	—	76.3	83.7	—	—	—	—	—	62.0	
Syrie et Liban	40	35	31	114.3	125.6	—	—	—	—	100	—	—	—	—	—	
Algeria	20	21	25	97.5	82.7	—	f)	—	—	f)	—	—	—	f)	—	
French Morocco	862	649	561	132.9	153.8	—	—	—	—	—	—	—	—	—	—	

(†) For the explanation of signs and figures indicating crop condition see cereals table and note page 435. —
(1) "Maggengo".

and extreme south, average the centre and poor in the south central. In Cambodia the harvest varies greatly; on the whole it is deficient. In Laos sowings have been retarded in the lowlying areas. The Indo-Chinese crop of the first half-year is consequently below the average.

French West Africa: In Mauritania about 148,000 acres of large and small millet are cultivated and production has been estimated at between 1,058,000 and 1,102,000 centals (1,890,000 and 1,968,000 bushels).

In French Guinea exceptionally large flights of locusts devastated the crop at the end of February and in the first days of March.

Egypt: Weather conditions in July were favourable to growth and maturity of semi millet. Some areas in Misia, Assiut and Girga provinces were slightly infested by stem-borer but no appreciable damage occurred. Heading was general in all areas. Early-sown crops were maturing. Harvesting was expected to start during the first half of August. The crop is satisfactory. Cultivation of nili maize was progressing favourably in July. Germination and growth are good.

On 1 August crop condition of nili was 100.

French Morocco: Like all the spring crops maize suffered from the drought and, despite the extension of area, the crop is very poor.

Réunion: Production this year is considerably reduced, though part of the harvest had already been made when the hurricane came in March. The damage seems to be over 30 %, so that production this year may be estimated at 26,000-29,000 centals (47,000-51,000 bushels).

Southern Rhodesia : Though here and there farms specially favoured with sufficient rains were expected to produce more than the average crop, the prolonged drought in most districts from about mid-January to mid-April, during the planting and growing periods, rendered it unlikely that normal yields would be obtained generally.

The maize area has given way greatly in 1930-31 to cotton, tobacco and groundnuts.

Production in 1930-31 is estimated at 2,600,000 centals (4,640,000 bushels) from an area of 273,300 acres. The percentage decrease in production from that of 1930 is 32 and that in area 14 ; the decrease from average production in the five years ending 1928-29 is 10 %, while area was identical with the average.

Union of South Africa : Threshing made rapid progress in June.

RICE

Bulgaria : In the second half of July weather was rainy. Crop condition on 1 August was 110, as on 1 July, against 100 on 1 August 1930.

Italy : At the end of July vegetative development was moderate.

The final estimate for area cultivated this year is 317,000 acres, against 360,700 in 1930 and 349,000 on the average of the five years ending 1929, the percentages with respect to the latter figures being 87.9 and 90.9.

United States . Total area under rice in 1931 is estimated at 958,000 acres, a decrease of 0.1 % on that of 1930 and an increase of 0.8 % on the mean of 1925-29. Area is smaller in Arkansas and Louisiana but larger in Texas and California. Production is estimated at 40.2 million bushels (18.1 million centals), a decrease of 2.7 % on last year and of 1.7 % on the mean for 1925-29. This year's unit yields are thus expected to be relatively low. Irrigation water has been comparatively scarce in Louisiana and Texas and there is a considerable amount of salt in the water supply in the former State east of the Mornantau River. In California the crop had begun to head in the latter half of July.

Korea : Area under cultivation in 1931-32 is estimated at 3,963,000 acres against 3,970,000 in 1930-31 and 3,885,000, the average of the five years ending 1929-30. Percentages 99.8 and 102.0.

Formosa : The crop of the first half-year is estimated at 14,305,000 centals (31,789,000 bushels) against 13,893,000 (30,872,000) in 1930-31 and 12,208,000 (27,128,000), the average of the five years ending 1929-30.

India : In Bengal transplanting of winter paddy has been carried out satisfactorily, except in the west, where rain has been insufficient, and harvesting of autumn paddy continued in July. Transplanting continued in Bombay, while in the Central Provinces it was reported at the beginning of August that heavy rains were urgently needed for transplanting.

Indo-China : The first crop has on the whole suffered from drought. In Tonkin the non-irrigated upland fields have a mediocre crop, but the lowland or irrigated fields are in very good condition ; as transplantings, carried out very late, eventually allowed

a normal area to be sown, the first crop will probably be average or a little above the average. In Annam the crops have suffered further from drought; in North Annam a number of fields will have only a mediocre crop; in Central Annam early varieties have given fairly satisfactory yields, up to 15 centals (34 bushels) per acre, but rice of the third, fourth and fifth months will have poor yields; in the South-Centre, low-land rice being predominant, the production of early varieties is very good on the whole; in South Annam yields have varied from about 9 to 11 centals (20 to 24 bushels) per acre. In Cambodia dry-season rice has been harvested only in moister localities.

On the whole, the first crop in Indo-China appears, therefore, to be under the average.

The season is a bad one, Movement of the crop has been slowed down and in Tonkin and Cochin-China superabundant stocks exist. The agricultural associations have requested the Government to promulgate measures for the purpose of reviving export. Prices are very low, especially in Tonkin.

Japan : Toward the middle of June weather was unfavourable, with low temperatures and lack of fine days, but at the end of the month changed for the better. Transplanting was hindered for from a few days to two weeks in the districts of Hokkaido, Johohu, Hokuriku, Kwanto and Josan. Owing to the bad market situation the amount of commercial fertilisers used decreased by 20 % from that used last year; the use of natural fertilisers, however, increased.

Weather in June was favourable. Crop condition on 1 July was good, against average on 1 July 1930.

Weather in July was unfavourable. Crop condition on 1 August was bad against good on 1 August 1930.

Egypt : Weather conditions in July were favourable to cultivation, germination and growth. Water is in adequate even in the authorized regions. The crop is being watered by means of artesian wells where these are to be found. Some cultivators were obliged to water their crop with drainage water. It was noticed that some areas were still being sown up to the middle of the month. Watering, transplanting and weeding were progressing. Areas that have been watered at the proper time are in satisfactory condition, but areas which have been inadequately watered are below the average.

POTATOES

On the basis of information that has reached the Institute and taking into account the relative stability of the area under potatoes in Europe (about 26 million acres, excluding the U. S. S. R.) it may be assumed that there have been no material changes this year in the area under the crop.

As regards crop progress it may be observed that owing to the very changeable weather in the northern hemisphere in the last few months, characterised now by excessive rains and lack of warmth, now by intense drought accompanied by marked rises in temperature, the crop has, in general, been able to continue regular development thanks only to its exceptional powers of resistance. The inclement weather will certainly not fail to be reflected, however, in the quality of the tubers and in yields. In fact, in several regions (France, Belgium, the Irish Free State, Great Britain and Northern Ireland, Switzerland) disease has already been reported while in others (Italy, Hungary, Austria) the yields are expected to be very poor and the tubers small.

Thus, given the great diversity in the weather and in consequence, the great diversity in crop condition, total European production is not likely to be far removed from the average.

Potatoes.

COUNTRIES	AREA					CROP CONDITION (†)											
	193†	1930	Average 1925 to 1929	% 193†													
				1930 = 100	Aver. = 100	I-VIII-193†			I-VII-193†			I-VIII-1930					
						a)	b)	c)	a)	b)	c)	a)	b)	c)			
1,000 acres																	
Germany . . . {s}	598	584	(i) 594	102.3	100.6	2.7	—	—	2.6	—	—	—	—	—	—	—	3.2
... {f}	...	6,346	6,405	...	...	2.5	—	—	2.6	—	—	—	—	—	—	2.8	—
Austria . . . {s}	...	59	46	...	...	2.7	—	—	2.5	—	—	—	—	—	—	2.8	—
... {f}	...	407	406	...	...	2.4	—	—	2.4	—	—	—	—	—	—	2.5	—
Belgium . . . . .	...	402	408	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bulgaria	32	35	26	92.9	122.3	150	—	—	150	—	—	—	—	—	—	150	—
Denmark . . . . .	...	167	173	...	...	—	—	—	—	—	—	(3) 94	101	—	—	—	—
Estonia . . . . .	...	168	166	...	...	—	—	—	(2) 98	—	—	—	—	—	—	—	(2) 91
Irish Free State .	348	347	369	100.4	94.3	—	—	—	—	—	—	—	—	—	—	—	—
Finland	174	175	172	99.3	101.0	—	f)	—	—	—	f)	—	e) f)	—	—	—	—
Engl. and Wales .	447	425	503	105.3	88.9	—	—	—	—	—	—	—	—	—	—	—	—
Scotland . . . . .	...	123	144	...	...	—	—	—	95	—	—	95	105	—	—	—	—
Hungary	710	682	657	104.1	108.1	—	—	—	31	—	—	—	—	—	—	—	—
Italy	878	863	868	101.7	101.2	—	—	—	—	—	—	—	—	—	—	—	—
Lithuania . . . .	...	403	347	...	...	—	—	—	—	—	—	—	—	—	—	—	—
Luxemburg	40	40	40	99.1	99.3	2.7	—	—	—	2.5	—	—	—	—	—	2.7	—
Malta	7	7	7	90.2	97.0	—	—	—	—	—	—	—	—	—	—	—	—
Latvia . . . . .	...	231	201	...	...	—	—	—	e) f)	—	—	—	—	—	—	—	—
Netherlands . . .	401	397	432	100.9	92.7	—	—	(3) 68	—	(3) 70	—	—	(3) 78	—	—	—	—
Poland . . . . .	...	6,602	6,125	...	...	(3) 3.4	—	—	(3) 3.4	—	—	—	—	—	—	—	—
Rumania . . . . .	...	468	482	...	...	—	—	—	—	—	—	—	—	—	—	—	—
Switzerland . . .	113	120	117	94.0	96.7	104	—	—	103	—	—	—	—	—	—	—	83
Czechoslovakia .	...	1,640	1,792	...	...	2.4	—	—	2.5	—	—	—	—	—	—	—	3.1
—																	
U. S. S. R. . . .	14,838	14,382	13,658	103.2	108.6	—	—	—	—	—	—	—	—	—	—	—	—
—																	
Canada	576	571	552	100.8	104.3	—	—	—	—	—	—	—	—	—	—	—	—
United States . .	3,506	3,187	3,369	110.7	104.1	—	—	—	74.3	—	—	—	—	—	—	—	75.9
—																	
Japan	641	—	315	—	203.8	—	—	—	—	—	—	—	—	—	—	—	—
Syria and Lebanon	14	14	12	100.0	116.6	—	—	—	110	—	—	—	—	—	—	—	—
—																	
Algeria s	(4) 20	30	25	66.7	78.5	—	f)	—	—	—	—	—	e)	—	—	—	—

(†) For the explanation of signs and figures indicating crop condition, see Cereals table and note on page 435.
— s) Early potatoes. — f) Late potatoes. — (x) Average 1927 to 1929. — (2) To July, 15. — (3) Middle of preceding month. — (4) Not including Oran.

In the United States, on the other hand, there has been a notable increase in area in respect both to last year, when there was a considerable contraction, and to the average for 1925-29. According to the first estimate the production of this country also will be greater than that of last year and the quinquennial average.

* * *

Germany : The rains of the second decade of July were very favourable to growth, but the damage to early varieties from the drought of the preceding month was not made up.

Austria : Early varieties are slowly fading and lifting has begun; the tubers are small on the whole and still contain a large proportion of water.

Late varieties are fresh and strong but flowering is feeble. Formation of tubers seems normal, but development is very backward.

Belgium : The lifting of early varieties is finished; yields and prices have been satisfactory. Semi-early and late varieties have a good appearance, particularly in fields

where selected plants have been used. Potato disease is reported and, if the wet stormy weather persists, the yield of late varieties may suffer. In the course of the month "study days" and a "potato week" were organised to promote the selection of healthy tubers. The crop is specially important in the region of the Ardennes.

Production of potatoes.

COUNTRIES	ENGLISH MEASURES			AMERICAN MEASURES			% 1931	
	1931	1930	Average 1925 to 1929	1931	1930	Average 1925 to 1929	1930 = 100	Average = 100
	Thousand centals			Thousand bushels			%	%
Germany	61,161	63,223	60,658	101,933	105,370	101,095	96.7	100.3
Bulgaria	1,720	1,852	829	2,866	3,086	1,381	92.9	207.5
Finland	14,833	17,314	16,784	24,721	28,856	27,972	85.7	88.4
Hungary	31,052	40,597	43,333	51,753	67,660	72,221	76.5	71.7
Luxemburg	4,162	3,525	3,818	6,937	5,876	6,363	118.1	109.0
Malta	670	644	599	1,117	1,074	999	104.0	111.8
Netherlands	63,282	67,016	73,267	105,467	111,691	122,109	94.4	86.4
Switzerland	16,898	13,492	15,633	28,104	22,487	26,054	125.2	108.1
United States	237,600	205,800	228,306	396,000	343,000	380,502	115.5	104.1

Estonia : On 15 July crop condition was a little above that on the same date last year but a little below the ten-year average. On that date it was still too early to estimate the crop. If there is plenty of rain the plants may still greatly improve, as happened last year.

Irish Free State : The crop has suffered from the cold condition of the soil consequent on the frequent rain from the second week of July onwards. Blight is general and in many instances second early varieties have been affected. Spraying was done more effectively than in previous years and where two or more sprayings were applied development of the disease was substantially checked.

France : July, excessively dry in the south and exceptionally rainy in the rest of France, was not favourable to the crop.

In the south-east the first liftings of early varieties gave mediocre yields ; in the south-west the crops have suffered greatly and the harvest is endangered. In the other regions the prevalent humidity has developed diseases and rot in several areas ; attacks of doryphora were at first kept in check in the centre but were renewed and are rather serious. So far quality has everywhere been affected and, though arrivals in the Paris region were sound up to the end of July, it is considered that a large part by the crop has suffered. The crop on the whole is abundant.

Great Britain and Northern Ireland : In England and Wales early varieties were being lifted in July in good condition and the crop was about average. The main crop is variable but has generally suffered from the excessive rain and lack of sunshine and a good deal of disease is now prevalent. The yield of the main crop will probably be under average but any forecast at so early a stage can only be speculative. In Northern Ireland crops are variable ; it is likely that the yield generally will be below average. Blight has there been very prevalent, though where spraying was carried out early and regularly the disease is not making such headway. Digging of early varieties was proceeding in July ; although the quality in most cases is good the tubers are small.

Hungary : At the beginning of August lifting of early varieties was begun. Yields are poor. Owing to the drought the tubers of late varieties are relatively small in number and in size. The rains have been of some assistance but in a number of districts came too late.

Italy : The crop is a poor one.

Latvia : On 15 July crop condition was average according to 45.1 % of the correspondents' replies, above the average in 26.2 % and below the average in 28.7 %. The unsatisfactory condition is due principally to drought.

Switzerland : The crop has made the best of the changeable, rainy and rather warm weather that prevailed in July ; only some delicate early varieties were attacked here and there by disease. Production was on 1 August estimated at 104 % of the average for the preceding ten years, an increase of 1 % on the July estimate.

Czechoslovakia : July was rather hot and dry ; toward the end of the month frequent precipitation in Bohemia and Moravia was, however, very beneficial. In Subcarpathian Russia and especially in Slovakia the crop has suffered very much from the drought.

Chile : Production in 1930-31 was 9,861,000 centals (16,435,000 bushels) against 8,869,000 (14,782,000) in 1929-30 and 7,609,000 (12,681,000) in the preceding quinquennium (111.2 % and 129.6 %).

United States : Throughout the country in general unit yields are expected to average somewhat higher, though in some areas, principally in the West and in some of the Central States, the heat wave is likely to cause a reduction. Owing, however, to increased area in all but a few of the Central States these will probably have a larger crop despite the lower unit yields. In the Western States production is expected to be much lower owing to the shortage of moisture and of irrigation water.

Indo-China : In Tonkin and Annam sweet potatoes have given fairly satisfactory yields, though late crops have suffered from the drought. This crop seems to have expanded in Annam.

SUGAR

At the beginning of July crop condition of sugar-beet in the European countries varied greatly but on the whole could be regarded as fairly good. Weather in July was generally favourable. Damage due to insects and to various diseases was reported in Germany, Poland, Italy, Austria, Hungary, the Netherlands and Belgium, but on the whole was not serious and was rapidly checked. Anxiety caused by the drought was in great part dissipated by the rains, which were frequently abundant. Roots are well developed and leaves luxuriant and the beet fields have a very good appearance. On 1 August crop condition was very satisfactory or showed improvement in respect to the preceding month in Germany, Austria, Belgium, Bulgaria, Spain, the Irish Free State, France, the Netherlands, Poland, Rumania, Sweden and Czechoslovakia. It was, on the other hand, less satisfactory in Great Britain, Denmark, Italy and Hungary. On the whole, crop condition in Europe on 1 August was good and better than on

Acreege of Sugar Beet.

COUNTRIES	1931 (1)	1930	Average 1925 to 1929	% 1931	
				1930 = 100	Average = 100
	Acres			%	%
Germany	872,129	1,157,104	1,062,529	75.0	82.0
Austria	106,000	89,000	61,846	119.0	172.0
Belgium	124,000	137,311	162,316	90.0	76.0
Bulgaria	37,000	48,789	34,946	76.0	106.0
Denmark	74,000	81,000	93,088	92.0	80.0
Spain	240,000	208,960	182,438	115.0	131.0
Irish Free State	8,200	14,389	14,211	57.0	57.0
Finland	4,900	3,090	5,296	162.0	94.0
France	620,000	679,480	583,647	91.0	106.0
Great Britain	234,000	348,920	165,415	67.0	141.0
Hungary	141,776	184,684	169,032	77.0	84.0
Italy	265,981	276,626	225,722	96.0	118.0
Latvia	7,000	5,900	—	125.0	—
Netherlands	91,225	142,196	157,114	64.0	58.0
Poland	408,000	457,000	510,179	89.0	80.0
Rumania	37,000	120,948	166,863	31.0	22.0
Sweden	85,300	96,520	77,988	88.0	109.0
Switzerland	3,600	3,040	3,657	104.0	86.0
Czechoslovakia	441,389	553,598	674,813	80.0	65.0
Turkey	19,769	11,120	19,739	178.0	100.0
Yugoslavia	120,000	147,798	110,277	84.0	112.0
<i>Total Europe . . . a)</i>	<i>3,941,269</i>	<i>4,767,563</i>	<i>4,481,111</i>	<i>83.0</i>	<i>83.0</i>
U. S. S. R.	3,692,500	2,832,000	1,626,471	130.0	227.0
<i>Total Europe . . . b)</i>	<i>7,633,769</i>	<i>7,599,563</i>	<i>6,107,582</i>	<i>100.0</i>	<i>125.0</i>
Canada	52,000	52,500	45,854	99.0	113.0
United States	754,000	821,000	675,416	92.0	112.0
<i>Total America . . .</i>	<i>806,000</i>	<i>873,500</i>	<i>721,270</i>	<i>92.0</i>	<i>112.0</i>
<i>General Total . . . a)</i>	<i>4,747,269</i>	<i>5,641,063</i>	<i>5,202,381</i>	<i>84.0</i>	<i>91.0</i>
<i>General Total . . . b)</i>	<i>8,439,769</i>	<i>8,473,063</i>	<i>6,828,852</i>	<i>100.0</i>	<i>124.0</i>

a) Not including the U.S.S.R. — b) Including the U.S.S.R. — (1) Approximate data. — (2) Average 1927 to 1929

1 July, and these satisfactory conditions very largely continued during the first half of August.

As usual there are published this month the results of the weekly analyses of weight of roots, weight of leaves and sugar content of roots, compared with the results of the last year and with the average. According to the first results Germany and Denmark, besides other countries not inserted in the table owing to absence of regular analyses, will this year show a certain decrease in weight of roots and consequently in absolute sugar content. This is not, however, to be attributed to deficient growth but to a delay that will probably be overtaken.

Production of Sugar Beet

COUNTRIES	ENGLISH MEASURES			AMERICAN MEASURES			% 1931	
	1931	1930	Average 1925 to 1929	1931	1930	Average 1925 to 1929	1930 = 100	Average = 100
	Thousand centals			Thousand short tons			%	%
Bulgaria	5,291	6,889	4,247	265	344	212	76.8	124.6
Hungary	18,290	32,210	32,947	914	1,610	1,647	56.8	55.5
Netherlands	25,653	47,127	46,341	1,283	2,356	2,317	54.4	55.4
U. S. S. R.	374,787	334,434	186,203	18,739	16,721	9,810	112.3	201.3
United States	144,000	184,000	147,105	7,200	9,200	7,855	78.3	97.9

As regards estimates of area, the changes in the relative table are not important. In the few countries for which first estimates of production are available there is a decrease as compared with last year where area under cultivation has been reduced, and there is an increase only in the U. S. S. R., which has expanded its sugar-beet area. The increase in production in the Soviet Union will, however, be relatively less than that in area.

Germany : The weather in July was generally favourable.

Austria : The beet is beginning to renew growth but is still thin.

Belgium : The crop has suffered from beet-fly but the recent rains have greatly improved condition

Irish Free State : Crop condition is generally good.

France : July, rainy with a short spell of fine weather towards its close, was favourable to sugar-beet of which the appearance so far is very good. No insect pests or diseases are reported

Sugar Beet.

COUNTRIES	CROP CONDITION (†)								
	1st August, 1931			1st July, 1931			1st August, 1930		
	a)	b)	c)	a)	b)	c)	a)	b)	c)
Germany.	2.6	—	—	2.9	—	—	2.7	—	—
Austria	—	3.0	—	—	—	3.1	—	—	3.2
Belgium . . . . .	—	...	...	e)	—	—	d)	—	—
Bulgaria	120	—	—	120	—	—	150	—	—
Denmark	—	—	94	—	—	(1) 95	102	—	—
Scotland	—	—	90	—	—	—	—	100	—
Hungary	3.2	—	—	—	—	—	—	—	—
Netherlands	—	(2) 66	...	—	(2) 63	—	(2) 73	—	—
Switzerland . . . . .	...	...	...	—	100	—	—	—	—
Czechoslovakia	2.7	—	—	—	3.0	—	—	—	3.1
Canada . . . . .	...	...	...	—	—	96	—	—	—
United States	—	—	78.9	—	—	—	—	—	85.2

(†) For the explanation of signs and figures indicating crop condition, see cereals table and note on page 435.

(1) July, 15. — (2) Middle of preceding month.

Great Britain and Northern Ireland : Crop condition in England and Wales indicates that the unit yield will be below average and the total production, in view of the reduced area, will thus be very considerably less than in 1930.

Hungary : Development has been hindered by the drought and the great heat. The leaves were beginning to yellow at the beginning of August. Abundant rains might still be beneficial.

Czechoslovakia : July was rather hot and dry ; toward the end of the month in Bohemia and Moravia frequent rains improved crop condition, but in Slovakia and Subcarpathian Russia the roots suffered considerably, especially in the former, where the drought reduced the area by about 80 %.

Sugar Season 1931-32. — Analysis of Sugar Beets.

Countries	Average weight of root			Average weight of leaves			Sugar content			Weight of sugar per root		
	1931	1930	1925-1929	1931	1930	1925-1929	1931	1930	1925-1929	1931	1930	1925-1929
	ozs	ozs	ozs	ozs	ozs	ozs	%	%	%	ozs	ozs	ozs
3RD WEEK OF JULY												
Germany	4.0	4.4	(1) 3.5	11.6	10.0	(1) 10.3	10.1	12.4	(1) 9.8	0.4	0.5	(1) 0.4
4TH WEEK OF JULY												
Germany	5.5	6.1	(1) 4.8	14.8	12.3	(1) 11.8	10.4	12.0	(1) 12.3	0.6	0.7	0.6
LAST WEEK OF JULY												
Germany	7.1	7.9	(2) 3.8	15.9	15.1	(2) 13.3	12.6	11.8	(2) 11.0	0.9	0.9	(2) 0.4
Czechoslovakia . . .	9.3	8.2	(3) 7.4	14.4	10.3	(3) 11.5	13.5	14.5	(3) 14.2	1.3	1.2	(3) 1.1
FIRST WEEK OF AUGUST												
Germany	8.5	9.5	6.9	17.0	17.0	12.6	13.8	12.7	12.5	1.2	1.2	0.9
Denmark	4.8	—	—	9.7	—	—	12.0	—	—	0.6	—	—
France	7.8	(4) 7.5	(4) 5) 6.7	16.2	(4) 21.7	(4) 5) 13.0	11.9	(4) 12.0	(4) 5) 12.9	0.9	0.9	0.8
Czechoslovakia . . .	11.2	9.6	8.1	15.0	11.1	13.9	14.3	15.2	13.3	1.6	1.4	1.1
2ND WEEK OF AUGUST												
Germany	9.6	11.6	8.2	16.1	17.6	13.3	14.4	13.8	13.6	1.4	1.6	1.1
Denmark	6.4	7.9	6.8	10.8	13.2	12.7	12.3	12.8	13.1	0.8	1.0	0.8
France	10.5	9.8	7.8	18.9	22.6	(1) 16.4	11.7	13.3	12.9	1.5	1.3	1.0
Poland	9.1	—	—	12.6	—	—	14.1	—	—	1.3	—	—
Czechoslovakia . . .	12.6	11.3	9.9	15.1	12.2	14.7	15.0	14.9	14.5	1.6	1.4	1.1
3RD WEEK OF AUGUST												
Germany	11.3	13.3	10.0	16.1	18.6	17.2	14.9	14.2	14.0	1.7	1.9	1.4
Denmark	8.0	9.6	9.5	12.1	13.7	14.0	13.1	14.0	13.6	1.1	1.3	1.3
France	12.2	11.8	9.7	20.7	—	16.4	13.3	13.9	14.0	1.6	1.6	1.5
Czechoslovakia . . .	14.0	—	11.9	15.6	—	15.1	15.5	—	14.6	2.2	—	1.7
(1) Average 1925 and 1927 to 1929. — (2) Year 1928. — (3) Average 1928 and 1929. — (4) Last week of July. — (5) Year 1929. — (6) Average 1925 and 1927 to 1929.												

United States: In the eastern territory (from Ohio to North Dakota) area under sugar-beet is only three-quarters of that sown in 1930, owing partly to the closing of several factories and partly to the low contract prices for beet. In Nebraska and Colorado, which together account for around 40 % of the total area, there has also been a decrease. In most of the western states, however, except Idaho there has been an increase of 9 % or more.

Production of sugar-cane in 1931-32 is estimated at 58,380,000 centals (2,919,000 short tons) against 51,180,000 (2,559,000) in 1930-31 and 43,524,000 (2,176,000) the average of the five preceding seasons. Percentages 114.1 and 134.1.

Porto Rico: According to the most recent estimate production of cane-sugar was 15,677,000 centals (783,900 short tons) against 17,320,000 (866,000) in 1929-30 and 12,897,000 (644,800), the average for the five years ending 1928-29. Percentages 90.5 and 121.6.

India : In Bihar and Orissa crop condition early in August was good.

Indo-China : The crop has been satisfactory in Tonkin and Annam ; in certain provinces of the latter yield reaches 37 to 40 centals (2 short tons) per acre.

Egypt : The weather in July was hot on most days of the month. It accelerated growth to a great extent.

Water was adequate except at the tails of some of the canals.

Stem borer was still noticeable in Beni-suef, Qena and Aswan provinces.

Growth is progressing satisfactorily. Cane formation commenced in early-planted areas. Hoeing was progressing in late-planted areas.

On 1 August crop condition was 100, against 101 on 1 July last and 99 on 1 August 1930.

Kenya : Production of sugar-cane in 1930-31 is estimated at 203,600 centals (10,180 short tons) against 149,100 (7,460) in 1929-30, an increase of 36.6 %.

Mauritius : Production in 1931-32 is estimated at 4,167,000 centals (208,000 short tons), against 4,871,000 (244,000) in 1930-31 and the average of 5,041,000 (252,000) in the preceding five years. Percentages 85.0 and 83.0.

This estimate is based on the probable damage done by the hurricane and assumes that the weather remains normal up to the end of the season. It must be considered as very approximate.

Réunion : An official report indicates that the crop this year has, owing to the hurricane, to the subsequent drought and to mosaic, been reduced by 30-40 % on the February estimate. This confirms the figure of 661,000-772,000 centals (33,000-39,000 short tons) given in June. Crops on the coastlands and in the lowlying areas have suffered less than those on the uplands. Generally the leeward side of the island suffered less since the crops were there less advanced.

Union of South Africa . Conditions for sugar-cane were most unfavourable in June and crop condition was 22 % below normal. The weather was very dry and cold with frost in places. During July, on the contrary, floods did considerable damage to plant and equipment. In some parts the rainfall was exceptionally heavy.

VINES

The vintage of Europe and North Africa was not favoured by the weather in July. Cryptogamic diseases have not however, been serious ; if oidium has been more noticeable than last year it has generally been restricted to the foliage. Losses from eudemis do not seem to have had great effect on the total crop. On the contrary drought has persisted and has been aggravated in the Mediterranean districts already affected, especially Spain ; it also spread over the greater part of Italy, the South of France, the Balkans and into Hungary. In Spain the damage is aggravated and widespread in the chief producing regions and at the end of July only a small crop could be counted on. In Italy only the Sicilian and Sardinian vintages have suffered greatly ; in the Peninsula the situation at the end of July was still satisfactory, as well as in the South of France. In the Balkans the situation remained good, if not very good. Only the Hungarian crop was partially compromised. In North Africa the loss has been estimated

Vines.

COUNTRIES	AREA					CROP CONDITION (†)								
	1931	1930	Average 1925 to 1929	% 1931										
				1930 = 100	Aver. = 100	I-VIII-1931			I-VII-1931			I-VIII-1930		
1,000 acres			= 100	= 100	a)	b)	c)	a)	b)	c)	a)	b)	c)	
Germany . . . .	...	203	201	...	...	19	—	—	2.0	—	—	2.6	—	—
Austria s)	...	77	80	...	...	1.7	—	—	1.6	—	—	2.1	—	—
Bulgaria	217	205	189	106.0	114.8	150	—	—	150	—	—	150	—	—
Spain . . . . .	...	3,242	3,429	...	...	...	...	...	120	—	—	—	—	—
Luxemburg	3	3	4	100.0	84.5	...	...	...	2.3	—	—	—	—	4.0
Switzerland . . . .	...	35	35	...	...	...	...	95	—	—	94	—	—	90
Syria and Lebanon.	124	126	123	98.6	101.2	—	—	—	—	100	—	—	—	—
Algeria { s)	672	601	528	111.8	127.3	...	...	...	e)	—	—	e)	—	—
French Morocco . .	786	671	(1) 595	117.2	132.0	...	...	..	e)	—	—	e)	—	—
Tunis	29	18	15	163.7	200.8	e)	—	—	—	—	—	—	—	—
	98	87	74	113.1	133.5	—	f)	—	e)	—	—	e)	—	—

(†) For the explanation of signs and figures indicating crop condition, see Cereals table and note on page 435. — s) Area bearing. — t) Total area. — (r) Average 1926, 1928 and 1929.

at 25 % of the crop ; there remains, however, owing to the extension of the area and the good weather conditions, a good crop estimated at a little above that of last year. The rains at the end of July allowed the vintage to be awaited without apprehension.

In this southern zone the general situation of the crop depended greatly on possible rains in August. In fact the vines of southern France received rain in the first half of August often stormy in character but generally beneficial and the crop appeared more assured. On the other hand the rains have been scarce and insignificant in Spain and Italy ; if the more northern vineyards of these two countries have resisted these conditions very well, on the one hand, in the provinces of Levante, Mancha and Andalusia and, on the other hand, in Campania, Apulia, Calabria and Sicily, the crop seems seriously compromised.

The yield on the whole in these two countries appeared to be appreciably below the average ; it will, however, be perhaps greater than that of last year, especially in Spain where it was then very poor. The scirocco and very high temperatures affected the North African crop in the early part of August.

The situation at the middle of August in the Mediterranean as a whole permitted a crop around the average to be expected, rather smaller if the drought persists, but certainly superior to that of last year.

The European vines not included in the Mediterranean area were at the end of July in very satisfactory condition, despite rainy weather, which had somewhat affected the French districts situated in that zone ; the vines of Central Europe (Germany, Switzerland, Austria, Czechoslovakia) were in good condition. In France very bad weather in the first half of August modified the situation. However, unless rainy weather persists, the loss does not seem to be very great ; the vines of Central Europe have not registered serious damage.

The general situation in Europe and North Africa at the middle of August allowed a total crop fairly near the five-year average of 3,454 million Imperial gallons (4,147 million American gallons) to be expected, unless the unfavourable circumstances above mentioned persist or extend ; in fact, production in 1931 appeared likely to be between 3,190 and 3,520 million Imperial gallons (3,830-4,227 million American gallons). A yield equal to the average of 1925-29, taking account of the variations in area, would give a production of about 3,564 Imperial gallons (4,280 million American gallons).

As regards the trade in wine July showed a certain activity in Spain and Italy; there was a certain export movement, especially towards France; in Italy the suppression of the additional consumption tax also determined a certain movement. Toward the end of the month calm was, however, reestablished and the stocks in the hands of growers and dealers are nearly sufficient to last until the vintage. In France calm was established after the beginning of July; the stocks in growers' hands are normal and crop movement is assured. In Algeria there remained scarcely $4\frac{1}{2}$ - $6\frac{1}{2}$ million Imperial gallons (5-8 million American gallons) in the cellars of growers. In the other countries the tone has not changed since last month: calm and abundant stocks.

The dominant note on all the markets, that seems to likely to persist until the vintage, is this: trade nearly provided for, absolute calm. Prices are beginning to reflect quite clearly the crop forecasts; they remain firm, with a slight upward tendency in Spain and a downward tendency in France and in Italy; in the other countries they remain low and only serious accidents to the vintage can diminish the influence of the heavy stocks that weigh on the market in Yugoslavia, Hungary, Rumania, Bulgaria.

In the southern hemisphere the only exact information since last month concerns Australia. Owing to the abundant stocks and the shrinkage of the British market and though the 1930-31 crop is smaller than that of last year, a grave crisis is expected in the 1931-32 season, for which there is no assurance of movement of stocks. Prices are very low. The Union of South Africa and the Latin American countries are in a similar situation.

* * *

Germany: Sufferency of soil moisture and warm weather greatly favoured development of the grapes in July. If the good weather continues an abundant vintage may be counted on. Oidium and peronospora have appeared here and there, favoured by the rains in the middle of July.

Austria: The branches are strong and foliage healthy. The bunches are abundant and are developing rapidly; the grapes are filling and are well formed. Table grapes are in particularly good condition.

Bulgaria: The heavy rains and the hail in the latter half of July did not do much damage, and crop condition on 1 August was very good. Production of grapes is estimated at 9,974,000 centals against 9,590,000 last year, and that of wine at 61,769,000 Imperial gallons (74,179,000 American gallons) against 57,744,000 (69,345,000) in 1930 and 33,235,000 (39,912,000) the average of the five years ending 1929. Percentages: 107.0 and 185.9.

France: July was very dry in the south and south-west and abnormally rainy in other areas. Without being very favourable to vines these conditions maintained them generally in the good condition in which they were at the beginning of the month.

In the south the crop began, however, to suffer from the drought and it certainly seems that its fate depends on possible rains in August; if there is rain the crop will be a good average. The grapes are well-filled and sound, if not very numerous; ripening is proceeding normally. Cryptogamic diseases have not had serious effects; mildew has been limited to some blemishes of small importance; oidium, though more widespread than last year, has in general attacked the leaves only in the majority of cases, leaving the fruit untouched. Owing to the advanced condition of the vines, of which the earliest

will probably be harvested in the last days of the month, there is little fear of a serious attack of these maladies.

Insects have caused rather more appreciable damage but the resulting loss is not very important; the second generations of cochylis and eudemis have been rather less numerous, a fact which permits it to be assumed that the attack will not be serious.

In the south-west the situation at the end of July was distinctly good. The rains of the last days of the month and the first days of August, feeble as they were, dissipated the fears caused by the drought in the central districts of Garonne. More plentiful in Bordelais and Dordogne, the rains have stimulated mildew with a certain intensity, but the first attacks were countered by pruning of the leaves; ripening has already commenced and is proceeding rapidly, thus rendering later serious spread of the disease less probable. The persistent bad weather, however, decreases the promise of the crop.

Similar considerations apply to the rest of the country, where mildew and a little rot have been reported in places. Violent storms in the centre have caused damage in the vineyards of the Loire. On the whole, unless the drought in the South and the bad weather in other areas persists, the total crop will be a good average, 1,200-1,300 million Imperial gallons (1,500-1,600 million American gallons).

In any case production this year will be almost certainly above that of last and above 1,100 million Imperial gallons (1,300), even if conditions in August are not favourable.

On the markets the revival reported last month has not persisted and quiet was reestablished in mid-July in the leading wine centres. The quantities leaving owners' hands in June were relatively important. It may be estimated that on 1 July there remained in growers' cellars about 290 million Imp. gall. (340) of wine, estimated free consumption being deducted, for commercial delivery. If taxable consumption is maintained at a high level it may be assumed that it will absorb scarcely less than 220 million Imp. gall. (260) in the three concluding months of the season. Estimating imports at 70-90 million Imp. gall. (80-110); it is apparent that the supply for the non-productive period is amply ensured. It is, however, probable that stocks in growers' hands and in traders' hands will be reduced; the latter, though lowered in June remain above 260 million Imp. gall. (320). Toward the end of July and at the beginning of August there was a marked tendency to diminution, stimulated by confidence in an easy inter-crop supply and by the good appearance of the vines.

(Mid-August report): The rains in the South on 8-9 August were in general of great benefit to the vines, accelerating maturity and definitely saving the crop from disaster due to drought; the vintage will probably begin toward the end of the month and promises to be a good average. Hail damage has not, however, been absent, especially in Provence, but has been local and is not likely to have a considerable effect on the crop as a whole; it has been more important in the other regions; damage has been chiefly shown in the delay to ripening, notably in the south-west, and in the provocation of rot and cryptogamic diseases. Should bad weather persist it may compromise rather seriously one-half of the crop. If, on the other hand, normal warm and sunny weather is reestablished in the concluding decade of the month damage may be limited and total production may still be satisfactory.

Movement of wine in July was relatively weak, showing a decrease on that of June and much more so on that of July 1930; taxable consumption remains at a high level, the data conforming to the indications already given; quietness persists and prices are falling.

Hungary: At the beginning of July in a number of districts weather became rainy. The crop was thus to some extent refreshed but the bunches were still showing the effects

of the drought and development was irregular. Some local damage due to hail was reported. Supplies are heavy, while demand remains weak.

Italy : In the first half of July prospects in peninsular Italy were good but in the Islands a rather small crop was expected owing to shedding and to parasites. In the latter half of the month, though continuing in good vegetation the vines began to show signs of suffering from the drought ; the harvesting of early table grapes was begun.

Luxemburg : The crop in general is promising. Up to now no cryptogamic diseases have been reported.

Switzerland : July, rainy, rather warm, and changeable, was fairly favourable. The soil was sufficiently moist, the bunches developed rapidly and the grapes are rather in advance of last year in their growth. Though the vines have in places suffered somewhat from cochylis and mildew crop prospects are satisfactory. On the basis of crop condition on 1 August, which was 95, production should be about 15,000,000 Imperial gallons (18,000,000 American gallons) against 14,000,000 (17,000,000) last year (106.3 %) and 12,282,000 (14,750,000), the five-year mean (121.8 %).

Canada : Production of grapes in 1931 in Ontario and British Columbia is estimated at 477,600 centals against 43,700 in 1930, an increase of 10 %. In Ontario, though it was too early to determine the final set, conditions indicated an increase of approximately 10 %, from 431,000 centals in 1930 to 473,000 in 1931.

Weather has been favourable to the development of the crop and no serious pest injury is reported. In British Columbia new vineyards coming into bearing in the Kelowna district have considerably increased the prospective yield, which is 45,000 centals against 27,000 in 1930, an increase of 67 %. Weather has encouraged a good set and progress has been favourable.

Algeria : The losses caused by the scirocco and consequent scorching of the grapes are estimated at 20-25 %. The crop, which toward the end of June was one of the best yet seen, was estimated at the end of July at 305,800,000 Imperial gallons (367,000,000 American gallons) ; it will still be a little above that of last year, and will be a record in quantity ; the very small increase in production does not however, correspond to the extension of vineyards in bearing.

It should be noted also that the August estimate is subject to serious modification, which may vary from 10 to 60 % and generally more.

Crop condition on 1 August though still *good*, was reduced from 125 to 100. The drought is at present injuring growth of the vines and filling out of the grapes. Eudemis and caterpillars, accompanied by sooty mould, are reported in many vineyards. Cryptogamic diseases have in some cases been serious but are localised and the damage seems on the whole not to be important.

The third generation of eudemis has appeared a week earlier than usual, the flights are numerous and the attack threatens to be serious.

French Morocco : Appearance is good and disease is almost absent. Crop condition 1 August was *good*, as on 1 June.

Tripolitania : Flowering occurred under varied conditions. The season has on the whole been normal, though there have been prolonged cold periods and very early hot winds.

Area this year is estimated at 8,800 acres, an increase of 18.6 % ; that in production is 1,700 acres, against 1,500 in 1930, an increase of 16.7 %. Crop condition on 1 June was good.

Tunisia : The scirocco of at the end of June and in the first half of July caused serious losses. Since 15 July temperatures have returned to normal and are more favourable to development of the grapes. Crop condition at the end of July was, however, very inferior to that of the preceding month.

Yields of wine per acre in bearing will be about 110 Imperial gall. (132 Amer. gall.) below that actually obtained in 1930, but, owing to the increased area, production should be only 440 thousand Imperial gallons (528 thousand American gallons), below that of last year, 21,338,000 Imp. gall. (25,625,000 Americ. gall.); percentage 97.9.

The present estimate is 2,200,000 Imp. gall. (2,642,000 Amer. gall.); above that made in July 1930 for the previous crop and 2,002,000 Imp. gall. (2,404,000 Amer. gall.). above the average of 1925-29, 18,896,000 Imp. gall. (22,692,000 Amer. gall.) percentage 110.6.

Production of grapes is estimated at 3,086,000 centals, 218,000 centals above the estimate made in July 1930 for production in that year (2,868,000 centals ; 107.7 %) and 643,000 centals above the 1925-29 mean (2,443,000 centals ; 126.4 %).

Australia : On the basis of data supplied by vigneron representing 90 % of the previous season's production in South Australia it is estimated that the vintage in that State for 1930-31 will be 9,100,000 gallons of wine, a decrease of 26.6 % on last year (12,406,000 gallons). The production of other States, which last year was 3,660,000 gallons, is also expected to be lower this year. On the basis of these data production in the Commonwealth may be placed at about 12 million gallons.

Quality is remarkably good, especially that of red wines, which is exceptionally so.

Production of table grapes for drying has this year been considerably below that of 1930 and 1929, owing especially to the decrease in the crop in non-irrigated vineyards.

May was very favourable as regards ripening of the wood and falling of the leaves so that crop condition in June was good. The soil and subsoil were sufficiently moist and it was hoped that the winter would not be too wet.

In consequence of poor sales a certain number of vigneron are considering the conversion of their vineyards to pasture.

The market situation is disastrous. Stocks are so abundant that several growers have not been able to find purchasers for their grapes and have had to convert them to wine themselves, the movement of surplus wines on to the local market seems to be difficult. A decrease in overseas shipments seems certain, as these are being maintained thanks only to the high exchange of the purchasing countries.

Prices are very low and a number of sales have been made even below the rate established by the Commonwealth Government.

The sales season for grapes has, on the contrary, been good. Internal consumption has been fairly large and overseas shipments show a slight increase.

OLIVES

July and the first half of August have not been favourable, due to the persistent drought and the great heat toward the middle of the month of July.

In the Western Mediterranean basin, Spain, Italy and North Africa, falling of fruit consequent on the heat has caused rather important losses and a good crop can no longer

be counted on. In the Eastern Mediterranean basin, especially in Greece, crop condition remained good.

There has been a general revival on the olive-oil market, followed by a rise in prices.

* * *

Greece : Weather in July was favourable and the crop is expected to be a very large one. According to the first estimate of the Ministry of Agriculture production of oil should reach 1,984,000 centals (26,073,000 American gallons), 4.3 % above that of 1930 and 21.0 % above the mean of the five years ending 1929.

Italy : In the first week of July, especially in the South, there was more or less serious falling of the fruit, further accentuated in the second week.

United States . Crop condition on 1 August was 45.0 % ; at the same date last year it was 68.0 %.

Syria and Lebanon : On the whole crop condition is good but on 1 July was 2 points below that of 1 June (100 instead of 102). This is due to the hot winds which have caused the fall of a certain quantity of small olives in the Alawiyya State, on the contrary, in the Greater Lebanon the regular rains have favoured flowering.

Total area of olives in the territories of the Levant under French mandate is estimated at 188,000 acres, of which 171,000 are in bearing ; this means a marked reduction on last year's area of 13.2 % for the total (216,900 acres) and 10.1 % for the area in bearing (190,300 acres) ; on the other hand there is an increase of 10.9 % on the five-year mean (169,700 acres).

Algeria : According to the July estimate the departments of Algiers and Oran will have 102,600 acres of olive trees of which 86,700 in bearing ; these figures mark a reduction on those of last year, which were 108,700 and 90,200 (94.3 % and 96.2 %) but remain above the average for the preceding five years (98,900 and 78,700 ; 103.7 % and 110.3 %).

The number of trees in the department of Constantine is approximately 5 million, of which 4 million should be in bearing ; these figures do not take into account the greater or less variations that may occur.

In May on the whole the Algerian olive groves represented an area of 211,300 acres, of which 190,500 in bearing, figures corresponding to the 1931-32 season but having only a general value as the trees in the department of Constantine are in great part not grouped in groves and the evaluation of the area is very inexact.

At the end of July the situation was *average* (75) instead of 100 at the end of June. The scirocco and the drought have caused shedding of the young fruits in a proportion estimated at over 50 % for the Colony as a whole. Last year at 1 August condition was estimated as 90, but it is known that the crop was very poor owing to the very unfavourable circumstances that supervened and caused the crop condition to fall to 50 in December. Whatever happens, the next harvest will not be abundant.

French Morocco : Crop condition on 1 August was considered *good*, as on 1 June:

Tripolitania : Flowering took place in average conditions and the weather, particularly as regards precipitation, has been normal.

Area in 1931-32, is estimated at 98,000 acres against 123,000 in 1930-31, a decrease

of 20 % ; that in bearing is 38,000, against 44,000, a decrease of 14.5 %. Crop condition on 1 June was good.

Tunisia : The trees suffered from the sciocco at the beginning of July ; temperature returned to normal on 15 July and is more favourable to vegetation. Crop condition at the end of July was considered average against good at the end of June but remains at 100.

COTTON

The first estimate of the United States Department of Agriculture for the 1931-32 crop places the average unit yield on the basis of crop condition on 1st August at 185.8 lbs. per acre, on an area of 40,129,000 acres expected to be harvested. Total production is placed at 74,492,000 centals (15,584,000 bales) of lint against an actual production in 1930 of 66,595,000 centals (13,932,000 bales), forecast on 8 August 1930 at 68,650,000 (14,362,000). The Department's report is accompanied by the following observations : " The condition of 74.9 per cent. reported as of 1 August is the highest 1 August condition since 1915 The indicated yield per acre of 185.8 pounds is higher than the yield secured in any year since 1914. . . . The amount of fertilizer used this year is less than has been used during the past few years While acreage in cultivation on 1 July 1931 was 10 % less than on 1 July 1930, the 1931 acreage is practically as large as in 1927 and much larger than in 1923 or any preceding year " .

It is noteworthy that crop condition on 1 August was higher than on the corresponding date last year in all the States of the Union, save Georgia and South Carolina. The production forecast is 11.9 % above that actually obtained last year and 2.1 % above the average of the five seasons from 1925-26 to 1929-30. Private estimates published just before the official estimate were, on the contrary, around 14 million bales 1 ½ million bales lower than the Department figure. The surprise occasioned on the market by the Report was accordingly all the stronger, prices underwent a further break and there seemed no chance of the downward movement being checked. The Report had the effect of bringing back the market brusquely to the realities of the situation, after a period in which the influence of political and financial factors of international magnitude had overshadowed the supply and demand situation. Now also for cotton the problem hangs on the disequilibrium between production and consumption and, whatever revival of manufacture and increase in consumption may be foreseen, it does not seem probable that prices will become remunerative to the grower during this season.

Meanwhile the U. S. S. R. continues to develop its cotton production. Information from that country indicates a crop probably over 13 million centals of lint, an increase of 80 % on that of last year, due to the expansion of area (50 %) and the improved methods of cultivation. At this rate the Soviet Union will become a cotton-producing country second only to the United States.

The first estimate, published in August, of area cultivated to cotton in India, indicates a decrease of 6.4 % on the corresponding estimate of last year and of 9.6 % on the average of the five seasons ending 1929-30. This area is inferior to that in every preceding year since 1922-23. The contraction in the cotton area in India, which becomes more accentuated every year, may be related principally to the increase in stocks and the depreciation of prices.

The Egyptian Ministry of Agriculture published on 3 August the estimate of area actually cultivated to cotton, which is about 20 % less than the record area of last year.

Trade forecasts did not go beyond a 13 % diminution. For Sakellaridis a marked reduction of 43 % on last year was already forecast some time ago (see Monthly Crop Report for last April) and the actual figure of 496,800 acres is to be related to the fact that the maximum area permitted by law was fixed at 584,500 acres. The area would perhaps have been greater, apart from the present price crisis, had not the weather and the scarcity of water and, above all, the large stocks of old crop of this variety in the hands of the Government not been obstacles. Of the other varieties Ashmuni and Zagora show a reduction of about 19 %, while of the remainder Maarad, Pilion, Nahda and Guiza 7 show a marked increase. Minor varieties, such as Casuli, have almost disappeared. The heavy reduction in area indicated by this estimate has not had any appreciable influence on the market, such as was expected; instead, the prices for Egyptian have undergone a further marked decline following on the publication of the United States estimate. The first official estimate of production will be made only in October, but it is forecasted that the crop will be reduced by about 10 % as compared with last year. On 15 July the ginning season of 1930 cotton came to an end, the results being 2,089,000 centals (437,000 bales) Sakellaridis and 5,916,000 (1,238,000) for Ashmuni, Zagora and other varieties; the amount of linters obtained was 190,000 centals (40,000 bales). The third and last estimate, published last June, gave figures that then appeared excessive, but in reality are below the actual results. At present picking is progressing satisfactorily; crop condition is better than some months ago; the delay in growth has been overtaken and the crop is on the contrary well forward; damage by parasites appears to be greatly reduced and there are no locusts, while Nile conditions are considerably improving.

* * *

Bulgaria: The second half of July was characterised by abundant rains. Crop condition on 1 August was 125 as on 1 July, against 100 on 1 August 1930.

U. S. S. R.: According to the Commissariat for Agriculture on 1 August the first cultivation was effected on 94.9 % of the area, the second on 81.5 % and the third on 54.0 %. Under the conditions prevailing this year when a significant part of the sowings has been made after only one ploughing, only three and in certain areas four, consecutive cultivations can ensure high yields.

United States: Production is estimated at 74,492,000 centals (15,584,000 bales of 500 lb.) against 66,595,000 (13,932,000) in 1930-31 and 72,983,000 (15,268,000), the average of the five years ending 1929-30, the percentages with respect to these figures being 111.9 and 102.1. This forecast is based on the forecast yield per harvested acre and the area in cultivation on 1 July less the ten-year average abandonment in each State after that date.

Temperatures have been favourable to the crop and progress was reported up to 19 August as fairly satisfactory, though there has been rather heavy rain in the Mississippi valley. Shedding has been only on a small scale. Crop condition was 74.9 against 62.2 in August 1930.

The acreage this year is smaller in every State except Florida, the largest proportionate decreases in the Cotton Belt having been in North Carolina and Oklahoma, which have only 82 % and 83 % of their 1930 area.

The amount of cotton of the 1931-32 season ginned up to 31 July 1931, the close of the 1930-31 season, was 34,900 centals (7,301 bales) against 373,700 (78,188)

at the same date last year, 415,700 (86,974) in 1929, 424,300 (88,761) in 1928 and 775,700 (162,283) in 1927.

Korea : Area in 1931-32 is estimated at 461,000 acres against 463,000 in 1930-31 and 495,000 on the average of the five years ending 1929-30. Percentages 99.6 and 93.0.

India : In the Punjab sowings commenced at the normal dates ; area is estimated at 2,141,000 acres a decrease of 7 % on that of 1930-31 and of 11 % on the average of the five years ending 1929-30

In Madras the area is 196,000 acres, half of this being last year's crop in the south under second picking and the rest being new sowings ; as compared with 1930-31 there is a decrease of 24 % and as compared with the five-year period one of 7 % in the total area for the Presidency.

In the Punjab there were beneficial rains throughout July and up to the second week of August. In Madras during the same period rainfall was very heavy on the west coast and moderate to heavy in the Circars, the Carnatic and the central districts.

In Bombay slight damage to newly-sown cotton by locusts was reported in Bairi, parts of Hyderabad and districts in Thar Parkar. In Sind there were general and beneficial rains in the latter part of July and, though there was no rain in the earlier part of August, irrigation water was ample and the crop was doing well.

(Telegram of 19 August) : The first estimate of area for 1931-32 is 13,926,000 acres against 14,878,000 in 1930-31, a decrease of 6.4 %, and 15,412,000 the average for the five years ending 1929-30, a decrease of 9.6 %.

Indo-China : The bushes in Annam have not suffered too much from the drought and the crop there is satisfactory.

Syria and Lebanon : Crop condition in the government of Latakia on 1 July was 100, as on 1 June.

French Equatorial Africa : Total production is estimated at about 22,000 centals (4,600 bales) of raw cotton.

Area cultivated in Ubangi-Shari is estimated at about 2,500 acres and it will increase to 3,700 acres this year and possibly in the next few years to 15,000 to 22,000 acres.

French West Africa : In Mauritania the area cultivated amounts to about 2,500 to 3,700 acres ; production last season was about 2,200 centals (450 bales) of raw cotton.

In Haute-Volta it is estimated that 70,800 centals (14,800 bales) of raw cotton from the last crop have been sold by the natives, though total sales in the preceding season were 93,600 centals (19,600 bales), the decrease being due to holding back by the native growers in face of the low prices rather than to decreased production. This state of affairs involves, however, serious risk as regards next season's crop.

Algeria : Growth is good though some losses from bollworm have been reported in the young crops. Condition at the end of July was average (75) against 80 at the end of June.

The area for 1931-32 has been reduced to 3,700 acres, 29.2 % of that of last year (12,700) and 24.6 % of the quinquennial mean. This large reduction is due to the crisis, which has aggravated the difficulties already experienced in Algeria in regard to the remunerative cultivation of cotton. There had already, in fact, been a marked reduction.

There was a fairly large development in the years immediately following the war, from 1,380 acres in 1923-24 to 15,100 acres in 1925-26 and a maximum of 21,500 acres in 1926-27. The yields in that season were particularly low. The following year the cultivated area fell to about 12,500 acres, a figure about which it oscillated in the following two years.

Egypt : Weather has been hot and favourable to growth as well as to flower and boll formation. Water for irrigation was inadequate, especially at the tails of canals and rills ; this caused a delay in rotations and gave rise to great difficulties.

Flowering in early-sown areas in Lower Egypt was almost complete at the end of July and bolls were approaching maturity. General crops and late-sown ones are still in the flowering and boll-forming stage. Favourable weather caused perceptible improvement in growth.

In Upper Egypt there was much improvement in late-sown areas. The early-sown crop was maturing, bolls on lower branches having opened. Picking is expected to start about the middle of August.

Where water was inadequate there was an unfavourable effect upon the crop. Hot weather made this effect more apparent, and the young buds and newly-formed bolls were shed in great quantities.

Insects and diseases caused little damage. On the whole, infestation by cotton worm was slight and no damage occurred to the crop ; egg-masses in certain districts were picked and hatched eggs destroyed. It is noticed that attacks of wilt disease were greater this year than they were last year in the immune types. Slight attacks of *aphis* on the one hand and of grasshoppers on the other were noticed in some districts but they were suppressed. Infestation by bollworms in Lower Egypt was 3 % in Sakel and 8 % in Ashmuni ; in Upper Egypt, it was 3 %.

On the whole, despite drought, crop condition is fair.

Total production of ginned cotton from the beginning of the season (1 September 1930) to 31 July 1931 is estimated at 8,005,000 centals (1,675,000 bales), of which there are 2,089,000 centals (437,000 bales) of Sakel ; production of linters is estimated at 190,008 centals (39,750 bales).

According to official data the total area under the crop for 1931-32 is 1,747,000 acres, a decrease of 19.2 % on that of last year (2,162,000) and of 4.4 % on the five-year mean (1,828,000). The reduction is due mainly to the governmental measures for restriction of Sakellaridis, which has fallen from 869,000 in 1930-31 to 497,000 acres this year ; Ashmuni and Zagora have also declined but to a less extent, from 972,000 to 788,000 acres. On the contrary, the other varieties, Pilion, Maarad, etc., show a considerable increase from 321,000 to 463,000 acres, thus compensating in part for the decrease in the principal varieties.

Anglo-Egyptian Sudan : The latest provisional estimate of production is 508,900 centals (106,500 bales) of ginned cotton against 665,400 (139,200) in 1929-30 and 508,000 (106,300), the average of the preceding five seasons ; percentages : 76.5 and 100.2.

Southern Rhodesia : Production of lint in 1930-31 is estimated at 8,400 centals (1,800 bales), an increase of 55.4 % on that of 1929-30 but a decrease of 18.6 % on the average of the five years ending 1928-29. Though area in 1930-31 is estimated to have increased by 88.5 % to 11,700 acres this was more than neutralised by the drought that prevailed from mid-January to mid-April.

Tanganyika : Planting has been adversely affected by the low prices paid last season and it is feared that the crop which was promising in June will be further reduced.

by the locust invasion. Production of ginned cotton in 1931-32 is estimated at 55,800 centals (11,700 bales) a decrease of 40 % on the 92,500 centals (19,400 bales) produced in 1930-31 and of 43 % on the average for 1925-29. In June bolling was reported to be well advanced. In the Lake Victoria area picking of early planted cotton had become general and the crop was yielding well

New Hebrides : Production in the last season has been very poor. On the one hand pests developed notably and on the other the natives neglected picking because of the low prices.

New Caledonia : Despite the increase in area production this year is below that of last year owing to decreased yields due to pests, which are becoming more serious every year.

FLAX

Fibre : In addition to the data on area cultivated for fibre, already available for a few countries (Finland, Italy, Netherlands, Czechoslovakia) and which indicated an appreciable decrease on both the 1930 area and the average for the preceding quinquennium, there are available only the data for Hungary, which has considerably increased area, particularly in comparison with the average for 1925-29, and for Estonia, where, on the contrary, area shows a decrease of 44 % with respect to last year and 50 % with respect to the five-year average. It appears that there has also been a notable decrease in Latvia (about 23 % with respect to last year and 40 % with respect to the average). For the other countries numerical data on area cultivated are not yet available but, judging from general indications and non-official estimates the reduction in area seems also to be considerable in such important producing countries as Belgium and France, so that this year the area in Europe (excluding the U. S. S. R.) will undergo a sharp contraction. This reduction will, however, be on the whole much less than the expansion that has taken place this year in the U. S. S. R.

Given the marked decrease in area in the border states of Europe and the generally not very favourable course of the weather, it may be stated with certainty that this year's production of fibre in Europe (excluding the U. S. S. R.) will be very small, below that of last year and very much poorer than the average of the five years 1925-29. Already the new estimate for the Netherlands shows an appreciable reduction on that of the preceding month, giving 95,000 centals, a decrease of about 59 % with respect to last year and of 63 % with respect to the average of the preceding quinquennium, while the area shows a diminution of 57 % in both respects.

As regards the situation in the U. S. S. R. precise information is lacking but it may be said that in July over a considerable part of the flax-growing area there were frequent but poor rains and rather high temperature ; toward the end of July harvesting had already begun in some districts and on 15 August had been completed on about 3.6 % of the cultivated area. It should be noted that in the current season 50 % of the flax area in the Union is on the kolkhozi and sovkhosi, against 10-11 % last year, and that the Government has established a detailed programme for harvesting, placing at the disposal of growers a certain number of machines for harvesting and for the first working up. According to the Plan the Government should receive from this year's crop about 6.2 million centals of fibre, of which the greater part will be utilized in the Union and the remainder, which, according to private estimates, will be around 1.3 million centals will be exported.

Flax.

COUNTRIES	AREA SOWN					CROP CONDITION (†)								
	1931	1930	Average 1925 to 1929	% 1931										
				1930 = 100	Aver. = 100	I-VIII-1931			I-VII-1931			I-VIII-1930		
1,000 acres														
						a)	b)	c)	a)	b)	c)	a)	b)	c)
Austria . . . . .	...	8	(1)	11	...	...	2.8	—	—	2.6	—	—	3.0	—
Belgium . . . . .	...	56		59	...	...	...	...	...	7)	—	—	—	—
Bulgaria	1	1		1	154.3	210.1	120	—	120	—	—	130	—	—
Estonia	45	80		89	55.6	50.1	—	(3) 93	—	—	—	—	—	(3) 91
Finland (2)	10	14		13	72.7	74.6	—	—	—	—	—	—	—	—
Hungary	44	36		7	123.0	602.3	—	—	—	—	—	—	—	—
Italy	24	27		47	90.6	51.7	—	—	—	—	—	—	—	—
Latvia . . . . .	...	128		163	...	...	—	100	—	—	—	—	—	—
Lithuania . . . . .	...	204		211	...	...	3.1	—	3.1	—	—	3.2	—	—
Netherlands	16	37		37	43.2	43.2	—	(3) 59	(3) 69	—	—	(3) 62	—	—
Czechoslovakia . . .	27	31		52	87.9	53.3	—	—	—	—	—	—	—	—
Yugoslavia (4) . . .	17	17	—	—	97.8	—	—	—	—	—	—	—	—	—
U. S S R.	7,489	5,553		4,289	134.9	174.6	—	—	—	—	—	—	—	—
Canada	661	582		563	113.6	117.3	—	—	44	—	—	46	—	89
United States	3,132	3,692		2,909	84.8	107.7	—	—	43.2	—	—	60.2	—	62.3
India	3,020	2,802		3,392	107.8	89.0	—	—	—	—	—	—	—	—
French Morocco . . .	67	58		48	116.1	140.3	—	—	—	—	—	—	—	—
Tunisia	5	—		6	—	84.9	—	—	—	—	—	—	—	—
Argentina	8,204	7,523		6,916	109.1	118.6	—	—	—	—	—	—	—	—

† For the explanation of signs and figures indicating crop condition: see Cereals table note on page 435. — (1) Average 1927 to 1929. — (2) Flax and hemp. — (3) Middle of preceding month. — (4) Winter crops.

Flax prices, which have recently remained almost stationary, showed a slight decline in the first half of August and are considerably below those of the corresponding period last year, having fallen to the pre-war level.

Linseed : Up to the present the data for this year's production of linseed are known only for the United States, Canada and India, which make up a total of about 17.6 million centals (31.5 million bushels), about 4.4 million (7.9 million) below that of last year and the average of the preceding five years. The decrease is due mainly to the poor crop in North America ; in the United States, in fact, the latest estimate is 2.2 million centals (3.9 million bushels) less than that of last month, while in Canada the expected production is exceptionally low, about half that of last year. For India the estimate published in June remains unchanged, showing only a slight decrease on the production of last year and about 4 % below the average. In Argentina sowings have just been completed. According to the Ministry of Agriculture an increase of area is expected in Santa Fé, the principal producing province, though drought and severe frosts have damaged early sowings. In increase on last years area is also expected in Entre Rios and Cordoba, but in Buenos Aires and on the Pampas a decrease is expected ; in fact there has been on the whole on increase of 9.1 % with respect to that of last year. In general frosts and drought hindered sowings and crop condition at the end of July varied from moderate to good.

* * *

Austria : At the end of July flax was low and thin. Pulling of early varieties has commenced.

Belgium : The crop has been pulled ; in general it is of good quality.

declines in area sown. These decreases are mainly due to the fall in price of jute, though in Bihar and Orissa insufficiency of rain at time of sowing also operated.

Large stocks of old jute are reported from most districts in Bengal and in some districts of the other two jute provinces.

In the early part of August rainfall in Bengal, which had been excessive toward the end of July, returned to normal. In the latter part of July harvesting continued.

Tea.

Ceylon : The area cultivated in the first six months of 1931 was 474,000 acres, the same as in 1930. Crop condition on 1 August was 90. There has been heavy rainfall.

India : In North India the weather in June was variable and crop prospects were less promising; in Upper and Lower Assam it was abnormally wet and in Darjeeling thrips was prevalent and blight was generally severe and checking leaf. In South India mild monsoon conditions prevailed throughout the month and general crop prospects were fair. In North India the statistics to the end of June record a decrease of 5,316,000 lb as compared with the same period last year, while in South India production was 3 % above that at the same date last year.

Production in 1930 is estimated at 391,134,000 lb. against 432,998,000 lb. in 1929 and 385,354,000 lb., the mean of the five years ending 1928. Percentages 90.3 and 101.5.

Japan : In the prefecture of Shizuoka, the most important for tea production, a 10 % increase in production was expected at the beginning of June. Weather has been generally favourable.

Weather in June was favourable and on 1 July crop condition was good against mediocre on 1 July 1930.

Weather in July was unfavourable. Crop condition on 1 August was rather bad against bad on 1 August 1930.

Cacao.

Gold Coast : The weather in July was dull and showery. At the end of the month 95 % of the minor crop was ripe; in the Central Province 90 % was harvested and in the Eastern Province rather less. In these provinces the beans put up for sale are entirely from the current minor crop, the last major crop having been disposed of. In Ashanti the weather has been unfavourable and harvesting began late; the quality of the beans held by farmers is fair; mould and germination are the chief defects of beans leaving Central Province ports. In the Eastern Province fermentation has been insufficient and the percentage of slaty beans is higher than last month.

The major crop was flowering satisfactorily in July and in some localities had finished, the flowers setting well. The season will begin at the normal time save in the Sahum and Krobo districts where it will be late. In the Central Province the season will end early.

Crop movement has been as follows :

	July 1931	Average July last 4 years	October 1930 to July 1931	Average October-July last 4 years
Shipments per steamer (centals). .	141.546	199 830	4.666.189	4.750.480
(sh. tons) .	7.077	9.992	233.309	237.524
Arrivals by rail at Tak-				
oradi and Accra . . (centals) .	10.595	31.136	2.686.230	3.162.880
(sh. tons) .	530	1.557	134.312	158.144

Coffee.

Tanganyika : Production in 1931 is estimated at 218,400 centals, a decrease of 16 % from the 1930 figure (258,700) but 27 % above the 1925-29 mean (172,200). The main picking was commenced toward the end of June in Arusha, in the principal coffee-growing region of the north. In the escarpment area in the south temperatures were unfavourably low for the crop.

Indo-China : In Tonkin the crop of *arabica*, *robusta* and *hiulon* has been deficient that of *excelsa* good. In Annam the crop of *arabica* made very good growth, though in the north flowering was poor. In Laos flowering of *arabica* was profuse.

Kenya : Production is estimated at 311,000 centals in 1930-31, 19 % above that of 1929-30 (261,000) and 71 % above the mean of the five years ending 1928-29 (181,500).

Réunion : The crop suffered greatly by shedding of the berries due to the cyclone and by the drought that affected it at the height of the growing season. In certain districts the loss may be reckoned at 70 % ; 10-15 % of the bushes were killed by the wind and tearing up of the roots. Production appears to be reduced by about 50 % and not to exceed 11,000 centals.

Groundnuts.

Indo-China : Production has been affected by the drought.

French West Africa : This crop is extending in Mauritania ; in all districts where rains or irrigation make it possible trials are being made.

Egypt : Weather conditions in July were favourable to growth, but water for irrigation was inadequate. Early-sown areas were in the flowering stage. Shortage of water had an unfavourable effect upon some of the areas and is expected to influence the crop.

On 1 August crop condition was 97 against 100 at the beginning of last month and 99 on 1 August 1930.

Southern Rhodesia : Production in 1930-31 is estimated at 50,000 centals, 15.6 % above the average for 1924-25 to 1928-29 but 2 % below last years crop. The increase in area from 7,500 acres in 1929-30 to 9,600 in 1930-31 has been more than offset by the prolonged drought in most districts during the planting and growing periods.

Tanganyika : The locust invasion is expected to have a serious effect on the exports from the Mwanza and Northern Tabora areas, which are most important for this crop. The estimated production in 1931 is 281,600 centals. In 1930 the export amounted to 388,300 centals and the average export for 1925-29 was 257,300 centals.

The harvest was completed in most areas in June, but not in Mwanza.

In some areas the effect of poor prices has been felt in diminishing the incentive to harvest the crop.

Rapeseed and Sesamum.

Austria : The first estimate of production is 45,400 centals (90,800 bushels) against 63,100 (126,100) last year and 40,700 (81,400) the average for 1925-29 (72 % and 112 %).

Bulgaria : In the second fortnight of July precipitation was abundant. Crop condition on 1 August and 1 July 1931 and 1 August 1930 was respectively 135, 135, 140 for colza and 150 at all three dates for sesame.

Netherlands : Production of colza is estimated to be 95,000 centals (190,000 bushels) against 114,000 (228,000) in 1930 and 124,500 (249,000), the quinquennial mean. (Percentages 83.1 and 76.1).

Japan : Area cultivated to colza is estimated this year at 182,000 acres little less than the mean.

On 1 July crop condition of colza was 97, against 100 on 1 July of last year.

Syria and Lebanon : On the whole in the two states of Syria and the Lebanese Republic there were sown this year 9,000 acres of sesame, an area slightly above that of last year (8,900 acres ; 102.5 %), but more than half below the average for the five years ending 1929 (19,200 acres, 47.7 %).

Tobacco.

Bulgaria : In the second half of July abundant rains fell. Crop condition on 1 August was 95 as on 1 July, against 100 on 1 August 1930.

Hungary : After the rains at the end of July crop condition improved. Harvesting was begun.

According to the first estimate the area sown this season is 58,500 acres, the same as last season, compared with 52,200 acres, the average for 1925-29 (100.0 % and 111.9 %).

Italy : The harvest, which commenced at the beginning of July, is poor.

Czechoslovakia : Area planted this year is 20,800 acres against 17,800 in 1930 and 14,200, the average for 1925-29, increases of 17 % and 46.4 %. July was very hot and dry ; development was below the normal.

Canada, (Telegram of 19 August) : The crop is excellent in Quebec and Ontario.

United States : Total area in 1931 is estimated at 2,090,000 acres, 1 % smaller than last year but 17 % greater than the average for 1925-29. The decrease this year of slightly over 9 % in fire-cured, the major type, has been largely offset by the increases of 13 % in Burley, the second most important type, especially in Southern Maryland, where area is 18 % over that of last year. All the fire-cured types, as well as dark air-cured types, also show increases in area. As regards cigar tobacco, filler types show about the same area as last year, binder types an increase of 2 %, wrapper types a decrease of 21 % and miscellaneous types an increase of 18 %. Total production is estimated at 1,617 million lb. an increase of 7.4 % on that of last year and of 19.1 % on the five-year average.

Indo-China : The crop has been good though the plants suffered in certain districts from the drought. Weather favoured preparation.

Japan : Transplanting was effected satisfactorily but was followed in the first half of June by unfavourable weather ; in the second half of the month there was, however,

a change for the better. Hail fell in the first half of the month at Shinjoku and Kuantō but did not cause serious damage.

Weather in June was fairly good and crop condition on 1 July was average; on 1 July 1930 it was fairly good. Area cultivated this year is 90,000 acres, a slight increase on last year's. The average of the quinquennium ending 1929 was 90,700 acres.

Crop condition on 1 August was good. On 1 August 1930 it was fairly good.

Syria and Lebanon: According to the July estimate 41,000 acres are under cultivation in the Levant States under French mandate, this figure, however, being still incomplete. Extension of the crop has been considerable and the area is now about five times that of last year (9,300 acres) and nearly six times the average area of the five years ending 1929-30 (7,500 acres).

On 1 July crop condition was good (100).

Algeria: The crop is reduced this year to 40,000 acres, a decrease of 11.4 % on the area of last year (44,700); the decrease began, in fact, in 1930, when it was 15,000 acres on that of 1929; during the five years 1925-29 area cultivated fluctuated around 65,000 acres (decrease this year 39.4 %). At the end of July the plantations had a rather irregular appearance, late transplantings were destroyed by hot winds at the end of June and in the first half of July. General condition is *average* (75), against 80 at the end of June. At the end of July the harvest was in progress; drying was effected under good conditions.

Southern Rhodesia: Production in 1930-31 is estimated to be 39 % above that of 1929-30, with 8,130,000 lb. against 5,844,000 lb., though this year's total is still 31 % below the average for the five years ending 1928-29. The increase in production is due to the increase of 44 % in area. The greatest relative increase is in Virginian dark fired, of which a production of 1,015,000 lb. is estimated, compared with 573,000 lb. in 1929-1930, while Virginian flue cured has increased from 4,921,000 lb. to 6,745,000 lb. and Turkish from 350,000 lb. to 370,000 lb.

Hops.

Belgium: Growth is backward; the crop has suffered from fly and Japanese mildew. Prices are so low that they scarcely cover cost of picking. So in the Poperinghe district the crop has considerably decreased and it is estimated that it occupies not more than 1,400 acres.

Great Britain and Northern Ireland: Weather conditions have not been very favourable to hops this year and while the bines have recently made good growth and appear to be vigorous, more sun is needed. Downy mildew and insect pests have been very prevalent and spraying and powdering have been carried out extensively. The area under the crop is 20,000 acres, only a very slight decrease from that of last year, but 18 % below the average of 1925-29. It is expected that unit yields will be below average.

Hungary: Average yields are expected.

Czechoslovakia: Very high yields are expected.

United States: Area this year is 21,000 acres, 5 % above that of last year and 10 % below the average of 1925-29, and production is estimated at 22.2 million lb., a decrease of 5 % on 1930 and of 29 % on the five-year average.

Sericulture.

Korea : Production of spring cocoons is estimated at 27,605,000 lb. against 28,404,000 lb. in 1930 and 19,953,000 in 1924-29. Percentages 97.2 and 138.4.

Indo-China : In Tonkin and North and Central Annam leafage has been good, despite various insect and fungoid attacks; in the South-Centre of Annam and in Cochinchina the scarcity of leaves is rather markedly felt.

Japan : In general weather in June was not deleterious to crop condition of mulberry, though in the prefecture of Nagano, one of the most important for the silk industry, hail caused significant damage.

Production of spring cocoons is estimated at 396,809,000 lb. against 463,825,000 in 1930 and 386,033,000 the average of the five years ending 1929, the percentages with respect to these figures being 85.6 and 102.8. Crop condition of mulberry on 1 July was average, on 1 July 1930 it was good.

Condition of the silkworms on 1 August was rather bad. On 1 August 1930 it was good.

Syria and Lebanon : On the whole in the Levant States under French mandate it is expected that this year there will be 66,500 acres under mulberries, of which 61,200 will be in bearing; the total area is almost equal (99.9 %) to that of last year (66,600 acres) but 8.8 % above the 1925-29 average (61,200 acres).

At the beginning of July crop condition was on the whole good (100), as at the beginning of June. The regular rains that fell in the Lebanese Republic caused leafage to develop.

Silkworm eggs placed in incubation this year amount to 72,300 oz., a diminution on last year (—28.1 %) and on the mean (—24.6 %). The reduction only partly affects production, which, according to July estimates, will be 6,316,000 lb. of fresh cocoons, a diminution of 21.5 % on last year and of 7.7 % on the average.

Tripolitania : It is estimated that the number of mulberry trees this year is 250,000 compared with 200,000 last year, the numbers in production being respectively 30,000 and 10,000. Crop condition on 1 June was good.

FODDER CROPS

In Europe the weather in July was dry in the south and in some parts of the centre (Spain, Italy, southern France, Hungary and some parts of Austria and of Czechoslovakia) fodder crops, especially permanent meadows and pastures felt the effects acutely. In the north, especially in the British Isles, on the other hand, the weather was prevalently rainy, sometimes excessively so, and almost all fodder crops benefitted, though in many districts the rains more or less greatly obstructed haymaking.

In Africa Algeria and many districts of French West Africa and of the Union of South Africa, suffered from marked drought. In Egypt clover production was normal.

In North America while fodder crops, especially pastures, over a large area in the United States felt the insufficiency of rains, the excessive precipitation in certain parts of Canada hindered haymaking and damaged the crops.

In Argentina an extension of area under fodder crops is expected and in July weather was favourable.

* * *

Germany : July weather favoured development of beet. Crop condition of meadows and pastures is a little poorer than last month, but in general is still satisfactory.

Austria : Mangolds have suffered great retardation in development. They have been sown to a greater degree than usual on stubble.

The first cutting of temporary grass and of permanent grass for two or three cuttings gave poor results but quality was good. The cause of the small yield is the drought, which is also injuriously affecting the second cutting. The results of the first cutting are as follows in comparison with those of the four preceding years.

Crop		1927	1928	1929	1930	1931
Red clover, hay	(ooo cent.)	8,532	8,020	10,631	8,311	5,313
	(ooo sh. tons)	427	401	532	416	266
Lucerne, hay	(ooo cent.)	1,896	2,326	2,260	2,932	2,249
	(ooo sh. tons)	95	116	113	147	112
Mixed clover, hay	(ooo cent.)	3,086	2,652	3,221	3,373	2,998
	(ooo sh. tons)	154	133	161	169	150
Grasses and mixtures of grasses and legumes	(ooo cent.)	1,587	1,459	1,437	1,587	1,168
	(ooo sh. tons)	79	73	72	79	58
Permanent meadows for 2 or 3 cuttings	(ooo cent.)	42,020	38,427	41,313	56,130	34,062
	(ooo sh. tons)	2,101	1,921	2,066	2,806	1,703
Maize for green fodder	(ooo cent.)	—	—	1,808	2,293	—
	(ooo sh. tons)	—	—	90	115	—

Vegetation of common pastures is very poor, while that of alpine pastures is fairly abundant.

Condition of fodder crops not included in the main table was as follows on 1 August : mixed fodder and vetches 3.3 (against 3.0 on 1 July this year and 2.9 on 1 August 1930) ; maize for green fodder 2.9 (2.9, 2.9) alpine pastures 2.3 (2.4, 2.8).

Belgium : Fodder crops are abundant. In general hay has been brought in under good conditions, the yield being rather above the average ; the aftermath is growing very well.

Denmark : The wet weather of July has been specially unfavourable to beet and meadows. On the other hand the rains have helped cabbage rape on the higher lands and also pastures.

Irish Free State : Mangels made some recovery during July but it is anticipated that the yield will be relatively low. Turnips made satisfactory growth. No damage to root

The Condition of Fodder Crops.

Crops and Countries	Crop Condition (†)								
	August 1, 1931			July 1, 1931			August 1, 1930		
	a)	b)	c)	a)	b)	c)	a)	b)	c)
CLOVER:									
Germany	2.9	—	—	2.8	—	—	—	3.0	—
Austria (1)	—	—	3.2	—	3.0	—	2.8	—	—
Estonia	—	—	(2) 90	—	—	(2) 90	—	—	(2) 98
Netherlands	—	—	(2) 66	—	—	(2) 67	(2) 76	—	—
United States	—	—	76.9	—	—	—	—	—	70.8
Egypt	—	100	—	—	100	—	—	—	99
ALFALFA:									
Germany	2.6	—	—	2.7	—	—	2.5	—	—
Austria	—	—	3.3	—	3.0	—	—	—	3.2
United States	—	—	64.6	—	—	—	—	—	72.1
MANGOLDS:									
Germany	2.5	—	—	2.8	—	—	2.7	—	—
Austria	2.9	—	—	—	3.0	—	2.7	—	—
Bulgaria	160	—	—	160	—	—	200	—	—
Denmark	—	—	91	—	—	93	—	—	—
Scotland	—	—	95	—	—	—	—	100	—
Lithuania	106	—	—	—	—	97	—	—	—
Switzerland	102	—	—	—	100	—	—	—	96
TEMPORARY MEADOWS:									
Austria (3)	—	3.0	—	2.5	—	—	2.7	—	—
Bulgaria	110	—	—	110	—	—	115	—	—
Denmark	103	—	—	106	—	—	—	—	—
Finland	101	—	—	109	—	—	104	—	—
Switzerland	4.2	—	—	4.4	—	—	4.3	—	—
United States	—	—	71.6	—	—	—	—	—	63.5
PERMANENT MEADOWS:									
Germany } irrigated meadows	2.4	—	—	2.1	—	—	2.4	—	—
Germany } other meadows	2.6	—	—	2.4	—	—	—	3.0	—
Austria	2.9	—	—	2.7	—	—	—	3.0	—
Bulgaria	150	—	—	150	—	—	150	—	—
Denmark	—	—	83	—	—	92	102	—	—
Scotland	105	—	—	—	100	—	—	—	95
Estonia	(2) 115	—	—	(2) 128	—	—	—	—	(2) 92
Finland	—	—	98	109	—	—	—	—	98
Netherlands (4)	(2) 77	—	—	(2) 82	—	—	—	—	—
Switzerland	4.2	—	—	4.3	—	—	4.2	—	—
PASTURES:									
Austria	—	—	3.7	—	—	3.1	—	—	3.4
Denmark	—	100	—	—	—	95	—	100	—
Finland	—	f)	—	—	—	—	—	f)	—
Scotland	—	100	—	—	100	—	—	—	95
Netherlands	—	—	(2) 64	(2) 81	—	—	—	—	—
Switzerland	4.3	—	—	4.6	—	—	4.0	—	—
United States	—	—	63.7	—	—	—	—	—	50.4

a) above the average. — b) average. — c) below the average. — d) excellent. — e) good. — f) average. — g) bad. — h) very bad. — (†) See explanation of the various systems on page 435. — (1) Red clover. — (2) At the middle of the preceding month. — (3) Klee gras. — (4) Meadows for hay.

crops from the bad weather or from insect pests has been reported but finger-and-toe disease is not uncommon.

Pastures generally made luxuriant growth. Most of the first and second crop hay was harvested in good condition early in July; later conditions were adverse to hay-making. Much old meadow remained uncut at the end of the month. Yield of hay is above average.

Old meadows cut during the month suffered from unsettled weather.

Areas under fodder crops are as follows :

	1931	1930	1925-29	% 1930	% 1925-29
	(000 acres)				
Turnips and swedes	178	179	191	100	93
Mangels	81	80	81	101	100
Hay	2,273	2,296	2,245	99	101

Finland : At the beginning of August production of roots and tubers for fodder was calculated at 11,365,000 centals (568,000 short tons) against 16,874,000 (844,000) in 1930. Percentage 67.4. Crop condition was below average. The corresponding figures for turnips were 9,117,000 centals (456,000 short tons) against 14,069,000 (703,000) Percentage 64.8.

Crop condition remained the same. For permanent meadow the figures are 9,385,000 (469,000) for 1931 and 9,437,000 (472,000) for 1930; 99.5 %. For temporary meadows 58,491,000 (2,925,000) in 1931 and 57,979,000 (2,899,000) in 1930, 100.9 %.

France : In the greater number of districts July was very rainy and rather favourable to fodder crops, beets, maize and fodder sorghum; despite the excessive rain that somewhat hindered haymaking, temporary and permanent meadows have given second crops and fairly plentiful aftermath; quality leaves something to be desired, however. In the early days of August violent storms following a period of fine weather spoilt the grass in the pastures and also seriously endangered the crop in the more backward districts.

On the other hand, in the south-west the second crops and aftermaths were, owing to the persistent drought, very poor.

These unsatisfactory circumstances, however, will not prevent the total fodder crop this year being extremely abundant.

Fodder grains gave very good results; they were harvested and brought in under good conditions, notably sainfoin, vetches and lucerne in the great producing region of Vaucluse and in the south generally.

Great Britain and Northern Ireland : The prevalently very wet weather of July has everywhere interfered seriously with the saving of the hay crop, harvesting being greatly interrupted, much of the crop being spoilt and part remaining uncut.

Quality of seeds hay has been damaged by the unfavourable harvesting conditions. Pasturage has had abundant growth but the continued wet weather has reduced its feeding value, and in some districts the tramping of stock has caused further deterioration.

Singling and cleaning of root crops has been very difficult owing to the wet weather and the exceptional prevalence of weeds. Mangolds have suffered from the lack of sunshine and in many areas have not developed well. The unit yield in England and Wales will on the whole probably be below average, though in Northern Ireland, given

sunshine, a fair yield is promised. In England and Wales, though sowing of turnips and swedes was retarded by the wet weather, good growth has been made and there is usually promise of a satisfactory yield; there have been few complaints of damage by fly. In Northern Ireland early-sown turnips are in good condition but late crops are backward. In Scotland crop condition of turnips and swedes on 1 August was 95, as on the same date last year. The following are the areas under fodder crops in England and Wales:

	1931	1930	Average 1925-29	% 1930 = 100 Aver. = 100	
Permanent grass	4,784	5,051	4,437	94.7	107.8
Temporary grass	1,726	1,595	1,596	108.2	108.2
Turnips and swedes	621	670	741	92.7	83.8
Mangolds	271	288	319	94.1	84.8

French West Africa: Exceptionally large flights of locusts have caused damage to pastures in Mauritania and Haute-Volta, and quality is poor owing to lack of water.

Algeria: Pastures are steadily drying up. Green fodder, clover, sorghum, maize and mangolds were harvested toward the end of July and beginning of August; production was affected by the drought.

An important invasion of caterpillars on the alfalfa has been reported in certain districts.

Egypt: At the end of the month of July, late sown areas of bersim (clover) had been completely harvested. Threshing, winnowing and storing were in progress. The yield is normal.

Crop condition of bersim was 100 on 1 August, as on 1 July, but 1 point below that on 1 August 1930.

Hungary: Following the rains at the end of July there were hopes of an improvement in mangolds. Early in August clover and lucerne were developing badly; the third cutting is likely to give only a poor yield. Amongst other fodder crops maize for green fodder and moha are thin and small.

The aftermath of permanent meadows is for the most part burnt up; only on lowly-lying lands is there some vegetation. After the rains at the end of July, however, there were hopes of some amelioration. Pasturage is also mostly burnt up.

Italy: In the first half of July the second cutting of grass was poor; crop condition left much to be desired owing to the drought. In the latter half of the month drought further diminished the later cuttings of non-irrigated temporary meadows and endangered the production of pastures, especially in Sardinia.

Latvia: On 15 July crop condition of clover was good according to 33.3 % of crop correspondents' replies, average in 62.3 % and bad in 4.4 %.

Lithuania: Hay-making was completed at the end of the month under satisfactory conditions, the crop being brought in dry.

Netherlands : At the beginning of July the drought had retarded growth of pastures though the situation improved subsequently.

Poland : The first cutting of hay was made under favourable conditions.

Switzerland : July, which was characterised by unstable conditions with a predominance of rainy weather, was rather unfavourable to grass, of which the crop condition is somewhat below that of last month. The second cutting of temporary and permanent meadows indicates satisfactory development; green fodder has been fairly satisfactory, a good crop is also expected for aftermath. The alps have satisfactory pasturage. July was very favourable to roots; condition of mangolds particularly was improved, from 100 on 1 July to 102 on 1 August, though on 1 August 1930 it was only 96. Condition of fodder legumes rose from 100 to 101 (99 on 1 August 1930).

Czechoslovakia : July was very dry and hot and only toward the end of the month were there frequent rains in Bohemia and Moravia. On 1 August crop condition of temporary and permanent meadows and of mangolds was about average in Bohemia and Moravia and below average in Slovakia and Subcarpathian Russia. In general temporary meadows are in much better condition than permanent meadows.

U. S. S. R. : In July the weather was prevalently hot. Frequent but somewhat poor rains fell in the south-west and north-west and more limited quantities in the centre of the European territory.

According to the People's Commissariat for Agriculture on 1 August hay had been cut on 92,745,000 acres, 60.5 % of the area planned.

Canada : The production of fodder crops is estimated as follows :

	1931	1930	1925-29	% 1930	% 1925-29
Hay and clover (million cent.) . .	342	328	315	98.8	102.9
(million sh. t.) . .	16.2	16.4	15.7		
Lucerne . . . (million cent.) . .	25	33	39	77.6	65.9
(million sh. t.) . . .	1.3	1.6	1.9		

The hay crop in the East has been a heavy one but rainy weather toward the end of July and in the early part of August retarded hay making and damaged the crop in the Maritime and Eastern Provinces. In the West the cooler and moister weather in the early part of August improved the general feed situation.

United States : Production of tame hay is estimated at 1,552 million cents (795 million short tons) 0.3 % below that of 1930 and 18 % below the five-year average. Production of lucerne is expected to be about 518 million cents (25.9 million short tons), a decrease of 10 % on 1930 and of 12 % on 1925-29.

Pastures have suffered severely from lack of moisture over a wide area.

Production of wild hay is estimated at 189 million cents (9.4 million short tons), 20 % below that of 1930 and 28 % below the five-year average.

LIVESTOCK AND DERIVATIVES

Condition of Livestock and Dairy Production.

Belgium : Health is good. Fodder is abundant, so reducing maintenance costs.

Irish Free State : There was an appreciable decrease in milk supplies to creameries in July.

France . The season has been unfavourable to milk output owing to the drought in Charentes and Deux-Sèvres, the leading dairy centres of the West, and a decrease of 10 % is probable ; in Brittany also there has been a deficit, though less strongly marked.

On the other hand, the season has been favourable to the condition of fat stock though the feeding quality of the grass sometimes leaves something to be desired. The animals are in good condition but, owing to the difficulties encountered by the graziers in regard to supplies of feed, not too numerous ; the stock are not in every case satisfactorily fattened.

The under-consumption of meat, which has been accentuated, and the considerable import from foreign countries render the market situation difficult. The tendency is weak but the position, unfavourable though it is with reference to the last two years, is not too disastrous.

Great Britain and Northern Ireland : The excessively wet and somewhat cold weather of July was not favourable to livestock. In Northern Ireland it is reputed, however, that store cattle are in fairly good condition though they have thriven more slowly than is customary at this season ; there has been a comparative freedom from warble fly.

Throughout the area milk yields have been well maintained and are about normal, though in Scotland a few districts showed a slight reduction during the month.

Ample supplies of concentrated feeding-stuffs are reported in Scotland and prices have fallen still further.

Italy : In some provinces fodder is inadequate.

Netherlands : In general milk production was up to the average in July. In some provinces only there was a slight diminution.

Switzerland : Total milk production for the second quarter showed a reduction of 10.94 % on that of the corresponding period in 1930 ; the decrease was 15.17 % in April, 10.95 % in May and 6.72 % in June. The marked falling back in April and May was due mainly to the lateness of vegetation. In addition, the decrease in number of cows and the more extensive utilisation of milk for stock rearing and fattening of calves have also contributed to the fall in milk deliveries.

United States : The 1931 lamb crop is larger than that of 1930 by about 8 %, the respective figures being 31,684,000 and 29,364,000. The number of lambs saved per hundred ewes one year old and over on 1 January rose from 87.4 to 89.6, the largest percentage in the eight years for which similar reports have been made. The increase in the lamb crop this year is due both to this and to an increase of about 5 % in the num-

ber of breeding ewes. Marketings of the year's crop have been exceptionally heavy and with the fall in demand there has been a record drop in prices, these being lower in June than in that month in any year since 1914.

The preliminary estimate of wool shorn or to be shorn in 1931 is 367,655,000 lb. or 7 % greater than the revised estimate of 342,667,000 lb. shorn in 1930 and not much different from the record clip of 1928, increased production being due to the larger number of fleeces and increase in weight per fleece.

Considerable reduction in numbers of sheep in the next two or three years is expected. The poor range in the west is expected to cause more than the usual proportion of the lamb crop to be marketed and fewer ewe lambs to be held back for breeding.

The June pig survey showed a 2.5 % increase in the spring pig crop compared with a year ago. There is also a marked increase in the number of sows kept for fall farrowing. It appears probable that the pig crop this autumn may be about one-fifth larger than that of last autumn. This tendency to expand production reflects the low prices for maize, being especially marked in the Corn Belt and in the Western States. Though pig prices are low maize prices are lower.

A considerable increase in maize area is indicated for this year and it is considered not unlikely that conditions in November and December will be such as to encourage a large increase in breeding for the spring pig crop of 1932. Large increases are probable not only in the Corn Belt proper but in the wheat growing areas of both the Middle West and the Far West. Slaughtering from pigs raised this year and marketed in the marketing year beginning 1 October 1931 are expected to be greater than the average slaughter during the four preceding marketing years.

French West Africa : Flocks have suffered from the bad condition of pastures in Haute-Volta and Mauritania. Health has been fairly good, though in some districts several centres of cattle plague and some cases of anthrax have been reported.

Algeria : Pastures being dry, the animals are at present feeding on stubble, but the reserves of the latter are limited. Flocks are suffering from the heat and some mortality from this cause is reported but on the whole condition remains satisfactory.

French Morocco : Health is excellent. Feeding is assured thanks to an abundant reserve of hay and dry fodder.

Union of South Africa : Losses of stock through poverty are being suffered in the Western districts of Cape Province and in Natal and heavier losses are expected. The insufficient rainfall of last summer has caused the failing of springs. In the Eastern Cape Province, Bechuanaland and the Northern Provinces, however, stock were still in good condition in June though, with the advent of real winter weather, cattle fell off in condition. Feed is also relatively plentiful and should be sufficient until the spring. The autumn lambs were generally doing well and on the whole the lambing season has been a success.

Australia : A preliminary estimate for the 1931-32 clip gives a production of 985,905,000 lb., 72,025,000 lb. above that of last year, despite the unsatisfactory market conditions of the last two seasons. The new clip is expected to be much heavier in condition and coarser in quality. According to the National Council of Woollselling Brokers of Australia the following was the wool position at the end of the 1930-31 season compared with that a year previously.

	Thousand pounds 1930-31	1929-30
Received into store 1 July-30 June	841,980	865,333
Sold by auction or privately	810,750	815,164
Shipped unsold	13,100	13,882
In store 30 June	18,130	36,287

Carryover from the previous season is not included in these figures; that of the 1929-30 clip still unsold in store amounted at the end of the 1930-31 season to 315,000 lb.

The increase in pigs in Germany as on 1 July 1931.

From 1 December 1930 to 2 March 1931, there was, as usual, a decrease in the pig population, followed by a fresh increase from 2 March to 1 June. As follows from the table below the present numbers considerably exceed not only those at the same period in 1930 and in 1929, but also those of 1928.

The number of sows for breeding over one year is relatively small and that of sows in farrow has decreased with respect to that on 2 March 1931 and also to that on 1 June 1928.

Numbers of pigs in Germany (1).

CLASSIFICATION BY SEX AND AGE	1 June 1931	2 March 1931	1 Dec. 1930	1 Sept. 1930	2 June 1930	1 March 1930	2 Dec. 1929	2 Sept. 1929	1 June 1929	1 Dec. 1928	1 June 1928	1 Dec. 1913(1)
(1000 head).												
Totals	22,528	21,790	23,365	23,423	19,805	18,649	19,944	19,604	16,795	20,106	20,187	22,533
Sucking pigs under 8 weeks of age	6,027	5,750	5,440	6,522	5,091	5,012	4,417	5,373	4,160	4,003	4,936	13,350
Young pigs from 8 weeks to 6 months of age . .	10,350	10,231	10,003	9,809	9,178	8,555	8,693	8,290	8,099	8,487	9,557	
Pigs from 6 months to 1 year of age	4,172	3,939	5,470	5,125	3,842	3,487	4,599	4,288	3,060	5,129	4,149	6,077
Of which :												
Boars for service . . .	54	58	67	57	57	54	56	50	48	53	52	—
Sows for breeding (total)	693	706	678	812	876	722	693	652	671	556	707	—
Sows served	(409)	(425)	(368)	(442)	(574)	(455)	(383)	(363)	(405)	(312)	(422)	—
Other swine	3,424	3,176	4,730	4,256	2,909	2,712	3,880	3,585	2,341	4,520	3,390	—
Pigs, 1 year old and over.	1,979	1,870	2,451	1,967	1,694	1,695	2,235	1,653	1,475	2,487	1,545	2,506
Of which :												
Boars for service . . .	71	62	62	61	57	51	50	58	55	52	60	—
Sows for breeding (total)	1,868	1,517	1,496	1,467	1,856	1,229	1,179	1,208	1,145	1,063	1,150	—
Sows served	(921)	(927)	(939)	(861)	(915)	(782)	(775)	(737)	(787)	—	—	—
Other swine	246	291	893	440	280	315	1,006	387	275	1,372	335	—

(1) Present territory, excluding the Saar.

Pigs in Denmark.

The Department of Statistics of Denmark has proceeded to a provisional estimate of the number of pigs, taking as base 1/5 of the material of the agricultural census of 15

July, 1931. The relative data, compared with those corresponding for the three preceding years, are as follows :

Classification	July, 15 1931	July, 15 1930	July, 15 1929	July, 15 1928
Boars over 4 months old	31,000	24,000	18,700	18,004
Farrowing sows over 4 months old .	437,000	390,000	309,600	243,069
Sows not farrowing over 4 months old	194,000	190,000	124,000	101,190
Fat pigs over 4 months old	1,167,000	1,011,000	775,300	733,127
Young pigs from 2 to 4 months old	1,854,000	1,602,000	1,285,600	1,256,132
Sucking-pigs under 2 months old . .	1,790,000	1,655,000	1,103,100	1,011,333
Total . . .	5,473,000	4,872,000	4,616,300	3,362,855

Livestock in the Irish Free State.

The statistics in the following table refer to the situation at 1 June of each year ; for the years 1918 to 1924 inclusive the estimates had to be made from sample returns. The estimates for 1931 have been made by applying to the known figures for 1930 percentage changes calculated from the changes in 629 District Electoral Divisions, out of 2,990, for which specially early figures were obtained.

YEARS	Thousand head							
	Cattle				Pigs		Sheep	Poultry
	Total	Milch Cows	Other Cattle, under one year	Other Cattle, one year old and under two	Total	Brood Sows		
1922	4,375	1,289	984	905	938	98	2,794	17,246
1923	4,278	1,209	972	857	1,186	124	2,666	17,278
1924	4,268	1,261	988	834	987	95	2,726	16,962
1925	3,991	1,183	919	771	731	75	2,813	17,279
1926	3,947	1,184	927	747	884	93	3,003	21,367
1927	4,047	1,234	1,001	780	1,178	124	3,120	21,584
1928	4,125	1,231	1,008	879	1,183	115	3,264	21,714
1929	4,137	1,227	1,010	875	945	96	3,375	22,089
1930	4,038	1,225	938	875	1,052	111	3,515	22,900
1931	4,042	1,223	936	884	1,221	123	3,618	22,467

The number of cattle, which has, taking the past decade as a whole, tended to decline, shows a slight increase this year. A further slight decrease in the number of milch cows has taken place, while the numbers of cattle under one year and of those one year old and under two show an increase, particularly marked in the former class.

The upward movement in the pig cycle continues, the relative increase in the total being still greater than last year and the number now estimated being the largest since the seventies of last century ; the increase in brood sows is, however, estimated at only 10.0 % as compared with 16.0 % in 1930.

Sheep continue the steady increase that has characterised the last eight years and the numbers as estimated are now greater than in any year since 1909.

Poultry numbers show a fall from the record figure of 1930, though they are still higher than in 1929.

Livestock in Hungary.

The results for 1931 of the livestock census, carried out annually in spring at the latest date up to 31 March (according to § 23 of Law XII of 1894), compared with those for the last quinquennium and for 1911 are collated in the following table.

With the exception of sheep (and not including buffaloes, asses and mules, which are of small numerical importance) all categories show an increase on last year.

CLASSIFICATION	1931	1930	1929	1928	1927	1926	(1) 1911
<i>Cattle</i>	1,807,429	1,777,886	1,812,876	1,804,575	1,798,551	1,847,449	(2) 2,149,756
of which cows	902,680	904,745	918,542	906,763	906,084	890,478	—
<i>Buffaloes</i>	6,465	6,747	6,978	7,077	6,887	8,039	—
of which cows	1,486	1,655	1,637	1,549	1,440	1,497	—
<i>Horses</i>	864,571	860,379	892,131	817,974	903,326	884,746	896,498
<i>Asses</i>	4,291	4,294	4,485	4,639	4,784	4,954	7,994
<i>Mules</i>	1,109	1,242	1,586	1,539	1,657	1,747	424
<i>Sheep</i>	1,440,409	1,463,834	1,573,180	1,566,451	1,610,716	1,804,068	2,406,041
<i>Goats</i>	24,027	22,184	23,793	29,836	36,418	48,633	20,647
<i>Pigs</i>	2,714,635	2,361,666	2,582,255	2,661,539	2,386,664	2,519,969	3,322,407
of which:							
sows under 1 year for fat	678,252	598,790	701,586	744,943	663,420	721,144	—
sows under 1 year for meat	123,881	88,757	77,439	81,426	65,474	53,020	—
castrated pigs under 1 year for fat	688,422	591,845	650,301	650,943	576,170	608,729	—
castrated pigs under 1 year for meat	140,426	105,545	81,813	81,155	60,477	54,291	—

(1) Present territory. — (2) Including buffaloes.

The increase in cattle, the most important category in the country (there being 20.8 cattle for each 100 of the population) was 1.7 %. It is interesting to note that this increase is not due to cows or oxen, which have decreased in numbers, but to lower age categories. Horses, which number 10 for each 100 of the population and which in general do not show any very important variation from one year to another, show only a slight increase of 0.5 % with respect to last year, due to mares and castrated adults.

Pigs register a record for the post-war period, attaining a quota of 31.3 for each 100 of the population, but are still under the 1911 figures. The increase with respect to 1930 is 15.0 %, and is common to all age categories. It is worthy of note that the numbers bred for meat have attained an absolute maximum, those for lard only a relative maximum, due to the preference of the market for the former.

Sheep maintain the tendency to decrease throughout the period under consideration, showing a fall of 1.6 % on the numbers of last year, their quota for each 100 of the population being now only 16.6.

Development of the Pig Industry in the Netherlands.

According to a recent report published by the Ministry of Agriculture the conditions of rearing and fattening pigs are becoming more and more unfavourable. Prices have declined owing to the expansion of market supplies, which in April, May and June were respectively 20, 16 and 17 per cent greater than in the same months of 1930. In correspondence with this decline in prices the number of sows in farrow was considerably lower in June 1931 than a year ago, though at the same time it was much higher than in 1929.

As the price of beef has fallen relatively little the consumption of pork in the country has greatly increased and the number of slaughterings for internal consumption was no less than 50 % greater in the first half of 1931 than in the same period of 1930. These slaughterings have greatly reduced the pig population, a fact reflected in the prices. While those of beef continued to decline there has been a slight revival in those of pork, and at the same time prices of fodder cereals have renewed their fall.

The index-number of prices of certain products illustrates the change in the situation (average prices for the five years ending 1925-29 are taken as 100):

	January 1931	March 1931	May 1931	July 1931
Beef	93	89	92	88
Pork	61	56	52	57
Rye	39	36	45	40
Barley	43	43	51	50
Maize	42	50	46	42

Livestock in the Kingdom of Yugoslavia.

According to recent data of the Ministry of Agriculture, the numbers of livestock in the Kingdom in 1930, compared with the corresponding figures for the preceding seven years, are as follows:

YEAR	Cattle	Horses	Asses	Mules	Sheep	Goats	Pigs	Buffaloes
1930	8,812,172	1,161,235	106,944	15,843	7,953,139	1,781,430	2,923,862	37,467
1929	3,728,038	1,140,343	106,117	15,469	7,735,957	1,803,574	2,674,800	36,846
1928	3,654,261	1,109,246	103,523	15,165	7,722,247	1,760,006	2,662,790	32,116
1927	3,729,343	1,120,310	97,509	14,865	7,735,015	1,733,958	2,769,343	30,990
1926	3,706,019	1,119,858	96,293	14,551	7,882,345	1,721,263	2,906,132	31,519
1925	3,768,185	1,106,142	95,236	14,504	7,906,808	1,810,669	2,802,355	27,431
1924	3,784,267	1,053,875	89,779	14,190	7,613,708	1,713,363	2,517,865	23,626
1923	3,869,985	1,062,393	94,720	14,849	7,689,267	1,730,204	2,496,723	31,717
1922	4,058,419	1,043,528	86,086	15,002	8,461,504	1,801,409	2,887,020	31,968

The production of maize and of other fodder cereals in 1930 was less plentiful than in the preceding year but this was compensated by good crops of other fodder. Favoured by the low prices of cereals and especially of maize and by the abundant yield of other fodder crops, supplies of feeding stuffs were more than adequate. The mild winter and various sanitary and economic measures in favour of stock-rearing under the recent law had a favourable influence on the general situation of stock, the sanitary condition of which in 1930 was satisfactory. There was an increase in all species except goats, most marked in pigs, the feeding of which was particularly favoured by the low prices of maize.

Livestock in Kenya.

A census of livestock was made on 28 February 1931. The census date has been brought forward from 31 July, so that all the data in the following table except those for 1931 refer to the latter date and not to 28 February.

The data refer only to livestock in European possession.

	Cattle	Woolled sheep
1931	236,895	218,845
1930	226,861	207,237
1929	218,390	210,912
1928	216,961	176,261
1927	215,650	172,299
1926	213,423	162,848
1925	216,589	140,725

The increase in cattle is 4.42 % over the figure for July 1930. For woolled sheep the increase was 5.6 % despite a high mortality rate. Wool output, however, decreased from 893,258 lb. in 1929-30 to 654,846 lb. in 1930-31. There was an increase in the quantity of milk sold in the year ended 28 February 1931 as against that sold in the year ended 31 July 1930, and a decrease in the quantity of farm-made butter. Farmers are disposing of butter-fat to creameries in increasing quantities.

Sheep in New Zealand.

The preliminary figures of the return of sheep on 30 April 1931 indicate a decline of a million and a quarter or 4.07 % from the number on the same date last year. It will be seen from the table below that this is the first decline in the last decade. The number of sheep in the Dominion has increased steadily since 1922, in 1928 it exceeded the previous maximum, reached in 1918. Though the fall from last year's figure is so marked the number in 1931 is still above that of 1929. The decline has been relatively greater in the North Island, which has over half of the total, than in the South Island and has been especially marked in the Gisborne-Hawke's Bay district, the leading district in the former island, being there 7.39 %; in the South Island the Canterbury-Kaikoura district, with 5.61 % has also registered an especially heavy decline.

	Thousands		Thousands
1931	29,585	1925	24,548
193	30,841	1924	23,776
1929	29,051	1923	23,081
1928	27,134	1922	22,222
1927	25,649	1921	23,285
1926	24,905		

LATEST INFORMATION

Spain : According to the first estimate production of beet-sugar will be 7,049,000 centals (352,500 short tons) in 1930-31, an increase of 13 % on that of 1929-30 (6,253,000 ; 312,700) and of 46 % on the five-year mean (4,825,000 ; 241,300). Production of cane-sugar will be 628,000 centals (31,400 short tons), an increase of 13 % (556,000 ; 27,800) and 54 % (247,000 ; 12,300).

Italy : According to an estimate of the Consorzio di Fabbricanti di Zucchero of Genoa production of sugar-beet this year will be 50,706,000 centals (2,535,300 short tons), a decrease of 24 % on that of last year (66,600,000 ; 3,330,000) and of 2 % on the five-year mean (51,465,000 ; 2,573,200).

The corresponding production of sugar is estimated at 7,716,000 centals (385,800 short tons) against 9,382,000 (469,100) and 7,039,000 (352,000) ; 82 % and 110 %.

Netherlands (Telegram of 26 August) : Crop condition on 19 August was 96 for wheat, 93 for rye, 96 for barley, 100 for oats, 88 for flax, 93 for potatoes and 90 for sugar-beet.

Rumania : Toward 20 August crop condition of maize was everywhere satisfactory and a good production was counted on.

Canada (Telegram of 25 August) : Harvesting is proceeding satisfactorily in the West. Hot, dry weather is general over the Prairie Provinces. In Saskatchewan and Alberta 50 % of the wheat is now cut ; in Manitoba threshing has commenced ; in central and northern Alberta heavy crops are ripening but cutting will not be general until September. Grasshopper and sawfly damage is prevalent and scattered hailstorms, in some localities severe, were reported last week.

For potatoes, maize and pastures the weather is too dry in Manitoba, southern Saskatchewan and southern Alberta.

Australia : Production of beet-sugar in 1930-31 amounted to 114,100 centals (5,706 short tons), an increase of 47 % on that of 1929-30 and of 133 % on the average for the five years ending 1928-29. This production was obtained from 857,700 centals (42,890 short tons) of beet (percentage increases 44 and 99) grown on an area of 3,045 acres (increases 22 % and 48 %).

TRADE

COUNTRIES	JUNE				ELEVEN MONTHS (August 1-June 30)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1931	1930	1931	1930	1930-31	1929-30	1930-31	1929-30	1929-30	1929-30
Wheat. — Thousand centals (1 cental = 100 lbs).										
<i>Exporting Countries:</i>										
Bulgaria	368	13	0	0	2,720	46	0	930	66	930
Hungary	375	564	0	0	5,221	9,709	0	0	9,943	0
Lithuania	0	15	0	0	536	49	4	2	55	2
Rumania . . . . .	...	...	...	...	(1) 6,580	(1) 318	(1) 7	(1) 40	1,279	40
U. S. S. R. . . . .	...	...	...	...	(2) 64,164	(2) 4,165	...	...	5,732	...
Yugoslavia	0	467	0	0	2,844	13,078	0	2	13,298	2
Canada	12,469	11,394	2	4	129,948	81,540	66	595	93,461	602
United States	4,881	4,880	809	992	38,716	50,120	10,631	7,033	57,274	7,885
Argentina	12,324	5,606	...	...	67,457	84,733	...	...	86,889	...
Chile . . . . .	...	...	...	...	(2) 425	(2) 82	(2) 0	(2) 0	481	0
India	198	1,067	664	278	2,092	1,332	6,080	3,867	2,758	3,081
Turkey . . . . .	...	...	...	...	(3) 181	(3) 7	(3) 7	(3) 408	24	414
Algeria . . . . .	...	...	...	...	(4) 5,315	(4) 2,535	(4) 540	525	3,206	545
Tunis	1,334	104	18	0	2,761	2,776	527	97	3,362	99
Australia	8,810	2,033	0	0	70,068	23,001	0	0	24,469	0
<i>Importing Countries:</i>										
Germany	0	7	2,584	1,301	265	2,288	16,213	29,729	2,293	31,725
Austria	0	0	675	1,241	86	40	4,636	5,382	68	6,455
Belgium	269	78	3,325	2,337	1,576	802	26,321	23,486	805	25,704
Denmark	0	0	873	198	35	128	4,478	2,652	128	2,903
Spain	0	0	0	0	4	11	0	2,145	11	2,152
Estonia	0	0	33	31	0	0	340	487	0	540
Irish Free State . . . . .	...	...	...	...	(2) 18	(2) 0	(2) 5,405	(2) 4,877	0	5,547
France	0	2,529	5,900	836	963	6,387	35,458	19,039	8,907	19,954
Gr. Brit. and N. Ir.	40	51	9,072	8,045	639	1,391	111,135	103,274	1,452	114,045
Greece . . . . .	...	...	...	...	(2) 0	(2) 0	(2) 11,402	(2) 10,293	0	12,339
Italy	0	0	6,506	5,296	22	4	48,134	23,847	4	27,150
Latvia	0	0	57	106	0	0	968	1,325	0	1,523
Norway . . . . .	...	...	216	154	...	...	2,895	2,061	...	2,216
Netherlands	2	29	1,248	1,649	675	216	15,598	13,655	231	14,036
Poland	119	42	2	2	1,720	262	49	245	289	331
Portugal . . . . .	...	...	752	637	...	...	1,030	3,150	...	3,732
Sweden	0	9	112	205	31	1,001	2,732	4,533	1,003	4,982
Switzerland	0	0	734	800	2	0	10,077	8,631	0	9,590
Czechoslovakia	0	22	800	231	4	95	6,385	3,366	108	3,602
Japan . . . . .	...	...	1,790	780	...	...	14,215	10,247	...	10,922
Syria and Lebanon	18	11	0	0	134	13	37	146	26	146
Egypt	0	2	4	7	2	13	1,014	11	13	24
Union of South Africa . . . . .	...	...	...	...	(4) 0	(4) 0	(4) 1,270	(4) 1,486	0	1,680
New Zealand . . . . .	...	...	...	...	(2) 0	(2) 130	(2) 136	(2) 164	130	170
Totals	41,207	28,877	36,176	25,120	405,158	286,267	340,840	288,220	317,795	316,861
Rye. — Thousand centals (1 cental = 100 lbs).										
<i>Exporting Countries:</i>										
Germany	0	1,087	35	86	1,213	10,005	661	1,898	10,520	1,922
Bulgaria	97	0	0	0	1,369	9	0	0	9	0
Hungary	20	322	0	0	1,645	2,888	0	0	2,919	0
Poland	134	397	0	0	5,753	6,618	0	18	7,293	20
Rumania . . . . .	...	...	...	...	(1) 750	(1) 355	(1) 0	(1) 0	377	0
Czechoslovakia . . . . .	...	...	...	...	(2) 478	(2) 1,276	375	240	1,325	254
U. S. S. R.	0	104	256	42	(3) 11,023	(3) 1,268	...	...	4,091	...
Yugoslavia	0	0	0	0	0	33	4	0	83	0
Canada	375	13	0	0	1,102	194	0	150	194	150
United States	7	0	...	...	90	1,369	...	...	1,378	...
Argentina	300	0	...	...	883	736	...	...	767	...
Turkey . . . . .	...	...	...	...	(3) 282	(3) 82	(3) 0	(3) 31	198	31
Algeria . . . . .	...	...	...	...	(4) 35	(4) 31	(4) 0	(4) 4	35	4
<i>Importing Countries:</i>										
Austria	0	0	176	582	9	0	2,116	2,500	2	2,857
Belgium	22	0	586	119	121	4	3,825	875	7	988
Denmark	2	0	392	534	4	2	6,986	5,626	2	6,151
Estonia	0	0	37	895	0	0	183	1,812	0	1,920
Finland	0	0	117	216	0	2	1,440	3,058	4	3,314
France	0	2	170	15	0	7	1,334	170	7	181
Italy	0	0	62	62	0	0	593	278	0	324
Latvia	0	0	11	75	0	7	251	2,000	7	2,191
Lithuania	0	20	0	0	163	79	0	24	86	24
Norway	0	0	280	324	0	0	2,800	3,497	0	3,605
Netherlands	99	2	906	243	728	84	6,010	2,538	90	2,908
Sweden	2	0	20	287	4	11	492	2,116	11	2,240
Switzerland	0	0	7	7	0	0	163	160	0	154
Totals	1,958	2,037	3,933	2,993	25,519	25,058	26,733	27,076	30,234	29,831

(1) (2) (3) (4) See notes page 50x.

COUNTRIES	JUNE				ELEVEN MONTHS August 1-June 30				TWELVE MONTHS (August 1-July 31)	
	IMPORTS		EXPORTS		EXPORTS		IMPORTS		IMPORTS	EXPORTS
	1931	1930	1931	1930	1930-31	1929-30	1930-31	1929-30	1929-30	1929-30
Wheat flour. — Thousand cents (1 cental = 100 lbs).										
<i>Exporting Countries:</i>										
Germany	2	75	15	15	126	1,188	184	683	1,226	710
Belgium	40	11	4	11	194	249	220	564	251	564
Bulgaria	26	0	0	0	201	7	0	0	7	0
Spain	0	4	0	0	68	64	0	0	66	0
France	895	472	35	37	6,537	3,223	531	348	3,796	392
Hungary	320	492	0	0	3,942	5,540	0	0	5,884	0
Italy	75	48	35	20	1,096	1,369	209	84	1,400	93
Latvia	0	9	0	0	73	40	2	2	42	2
Poland	20	9	0	0	593	146	22	35	154	35
Rumania . . . . .	...	...	...	...	(1) 291	(1) 146	(1) 0	(1) 0	317	0
Yugoslavia	2	15	0	0	88	309	2	2	820	2
Canada	961	1,171	4	9	12,198	11,093	46	137	13,285	143
United States	1,614	1,843	0	0	21,193	23,356	2	2	25,234	2
Argentina	170	234	—	—	1,750	2,432	—	—	2,504	—
Chile . . . . .	...	...	...	...	(2) 97	(2) 170	(2) 0	(2) 15	2,903	18
India	112	106	0	0	963	1,025	2	2	1,113	2
Turkey . . . . .	...	...	...	...	(3) 29	(3) 2	(3) 0	(3) 73	7	75
Japan	137	29	11	31	3,285	2,123	203	351	2,304	379
Algeria . . . . .	...	...	...	...	(4) 234	(4) 93	(4) 37	(4) 46	134	57
Tunis	18	13	0	0	236	139	11	4	150	4
Australia	917	849	0	0	9,687	8,373	0	0	9,165	0
<i>Importing Countries:</i>										
Austria	4	0	300	626	13	2	2,474	3,267	4	3,772
Denmark	2	2	112	123	22	29	1,466	1,307	31	1,440
Estonia	2	0	4	9	2	0	86	110	0	123
Irish Free State	—	—	176	223	(2) 35	(2) 42	(2) 3,082	(2) 3,060	64	3,622
Finland . . . . .	—	—	...	...	—	—	1,982	2,282	—	2,487
Gr. Britain and N. Ir.	377	355	1,067	1,030	4,209	4,319	11,753	11,405	4,727	12,487
Greece . . . . .	—	—	...	...	—	—	(2) 148	(2) 441	—	494
Norway	0	0	203	117	2	2	1,279	1,265	2	1,876
Netherlands	2	13	437	348	108	190	3,499	2,436	203	2,760
Portugal	—	—	24	15	—	—	193	137	—	152
Sweden	0	4	2	33	2	86	68	355	90	379
Czechoslovakia	0	2	15	214	11	11	2,410	3,122	13	3,333
Ceylon	—	—	42	31	—	—	403	388	—	430
Java and Madura . . . . .	—	—	...	...	—	—	(2) 840	(2) 946	—	1,142
Indo-China . . . . .	—	—	...	...	—	—	(2) 370	(2) 443	—	549
Syria and Lebanon	7	0	22	15	13	0	152	406	0	425
Egypt	0	0	258	331	0	4	3,265	4,511	4	4,729
Union of South Africa . . . . .	...	...	...	...	(4) 9	(4) 20	(4) 258	(4) 430	31	438
New Zealand . . . . .	...	...	...	...	(2) 2	(2) 4	(2) 192	(2) 150	4	181
Totals	5,712	5,754	2,766	3,245	67,314	66,696	35,395	38,897	72,624	42,842
Barley. — Thousand cents (1 cental = 100 lbs).										
<i>Exporting Countries:</i>										
Bulgaria	22	2	0	0	1,574	235	0	0	309	9
Spain	4	11	0	2	141	143	0	9	163	0
Hungary	7	93	0	0	580	2,352	4	0	2,363	0
Lithuania	2	4	0	0	15	139	0	0	143	0
Poland	15	146	0	0	2,793	5,664	0	2	5,794	2
Rumania . . . . .	...	...	...	...	(1) 26,784	(1) 24,718	(1) 0	(1) 0	31,865	0
Czechoslovakia	4	22	0	0	3,001	2,518	4	15	2,618	16
U. S. S. R. . . . .	...	...	...	...	(3) 22,966	(3) 9,187	—	—	12,291	—
Yugoslavia	4	11	0	0	24	278	130	159	232	159
Canada	2,976	29	0	0	7,965	1,248	0	9	1,250	9
United States	353	190	—	—	4,722	8,510	—	—	8,774	—
Argentina	644	152	—	—	5,344	2,465	—	—	2,575	—
Chile . . . . .	...	...	...	...	(2) 410	(2) 679	(2) 0	(2) 0	897	0
India	106	7	2	0	110	13	2	11	26	11
Syria and Lebanon	192	95	0	0	860	485	4	20	608	20
Turkey . . . . .	...	...	...	...	(3) 289	(3) 42	(3) 0	(3) 7	51	7
Algeria . . . . .	...	...	...	...	(4) 1,378	(4) 2,013	(4) 225	(4) 126	2,202	130
Egypt	0	0	29	2	2	64	170	35	64	40
Tunis	20	46	4	0	198	2,560	388	35	2,652	63
Australia	95	22	0	0	1,512	289	0	0	824	0
<i>Importing Countries:</i>										
Germany	0	110	862	1,750	62	950	14,520	47,393	1,089	26,735
Austria	0	0	152	236	0	0	1,925	1,598	9	1,259
Belgium	108	13	688	304	1,021	139	9,061	7,467	176	7,627
Denmark	13	15	1,325	595	1,230	1,230	14,002	3,587	1,232	4,450
Estonia	—	—	0	0	—	—	18	68	—	68
Irish Free State . . . . .	—	—	...	...	(2) 20	(2) 28	(2) 276	(2) 15	26	26
France	0	46	633	35	22	826	7,220	1,413	348	1,457
Gr. Britain and N. Ir.	7	2	1,093	928	63	35	17,432	18,594	33	14,454
Greece . . . . .	—	—	...	...	—	—	(2) 77	(2) 397	—	401
Italy	0	0	40	58	0	9	785	342	9	368
Latvia	0	0	2	2	0	0	203	121	0	123
Norway	0	0	218	71	0	0	1,030	679	0	752
Netherlands	18	4	1,025	786	582	478	13,618	7,253	487	7,934
Switzerland	0	0	187	84	0	0	2,606	1,755	0	1,918
Totals	4,599	1,020	6,258	4,798	83,662	66,858	84,515	86,110	77,955	91,994

(1) (2) (3) (4) See notes page 501.

COUNTRIES	JUNE				ELEVEN MONTHS (August 1-June 30)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1931	1930	1931	1930	1930-31	1929-30	1930-31	1929-30	1929-30	1929-30
Oats. — Thousand cents (1 cental = 100 lbs).										
<i>Exporting Countries:</i>										
Germany	2	1,852	139	7	218	14,903	802	602	15,245	620
Irish Free State . . . . .	...	...	...	...	(2) 247	(2) 608	(2) 271	(2) 71	661	115
Hungary	0	35	29	0	13	717	117	0	728	0
Lithuania	0	15	0	0	84	174	0	0	179	0
Poland	4	205	0	2	132	1,600	0	66	1,803	66
Rumania . . . . .	...	...	...	...	(1) 1,288	(1) 1,122	(1) 0	(1) 0	1,834	0
Czechoslovakia	0	88	9	15	710	1,285	20	128	1,345	128
U. S. S. R. . . . .	...	...	...	...	(3) 9,513	(3) 1,008	—	—	1,658	—
Yugoslavia	0	0	0	1	2	9	84	46	9	51
Canada	778	33	0	2	2,231	487	234	1,182	679	1,182
United States	20	9	0	11	119	1,404	198	49	1,576	49
Argentina	2,075	606	—	—	13,547	6,047	—	—	6,508	—
Chile . . . . .	...	...	...	...	(2) 1,881	(2) 503	(2) 0	(2) 0	622	0
Algeria . . . . .	...	...	...	...	(4) 1,036	(4) 340	(4) 126	(4) 119	459	128
Tunis	29	46	0	0	507	761	0	0	860	0
<i>Importing Countries:</i>										
Austria	0	0	203	421	2	0	1,989	2,597	2	2,707
Belgium	0	0	225	237	2	2	3,157	2,577	4	2,773
Denmark	0	0	163	208	20	20	1,149	2,624	20	2,800
Estonia	0	0	22	11	0	0	159	104	0	106
Finland	0	0	49	40	7	0	192	425	0	476
France	0	4	322	57	18	78	2,024	1,612	77	1,671
Gr. Brit. and N. Irel.	15	13	838	1,224	386	298	9,372	8,998	306	9,653
Greece . . . . .	—	—	...	...	—	—	(2) 0	(2) 205	—	207
Italy	0	0	245	265	0	0	3,677	1,537	0	1,700
Latvia	0	7	4	4	4	90	57	99	163	99
Norway	0	0	0	75	4	2	4	154	2	170
Netherlands	11	4	456	348	306	176	3,243	3,558	185	3,728
Sweden	0	0	201	73	40	57	1,116	1,199	60	1,290
Switzerland	0	0	302	331	2	0	4,244	4,092	0	4,398
Australia	4	11	0	0	71	44	2	2	49	4
Totals	2,941	2,938	3,207	3,475	32,450	31,799	32,306	31,996	35,034	34,126
Maize. — Thousand cents (1 cental = 100 lbs).										
EIGHT MONTHS (November 1-June 30)										
<i>Exporting Countries:</i>										
Bulgaria	273	540	0	0	3,157	2,837	0	0	4,017	0
Hungary	2	170	415	0	234	3,232	1,706	4	3,351	132
Rumania . . . . .	...	...	...	...	(1) 6,065	(2) 9,321	(1) 0	(1) 0	28,424	2
Yugoslavia	430	1,067	0	0	6,014	9,603	7	11	12,013	33
United States	40	397	35	35	805	3,671	483	212	4,303	708
Argentina	27,205	4,870	—	—	107,641	49,988	—	—	90,331	—
Brazil . . . . .	...	...	—	—	(4) 11	(4) 311	—	—	325	—
Java and Madura . . . . .	...	...	—	—	(2) 1,695	(2) 1,468	—	—	1,759	—
Indo-China . . . . .	...	...	—	—	(2) 1,550	(2) 1,213	—	—	2,339	—
Syria and Lebanon	11	42	13	4	150	313	49	13	434	35
Egypt	0	2	13	2	4	18	80	11	20	33
Union of South Africa . . . . .	...	...	...	...	(4) 1,027	(4) 1,927	(4) 0	(4) 0	12,267	0
<i>Importing Countries:</i>										
Germany	0	0	899	1,250	0	0	5,262	12,063	0	16,806
Austria	0	4	335	362	2	11	3,406	3,117	18	4,312
Belgium	150	7	1,420	990	582	163	9,934	7,002	220	12,308
Denmark	0	0	1,204	485	0	0	6,283	4,211	0	6,250
Spain	0	0	117	141	0	0	2,430	3,422	0	3,840
Irish Free State . . . . .	...	...	...	...	(2) 26	(2) 21	(2) 5,412	(2) 3,806	29	8,047
Finland . . . . .	...	...	13	7	128	128	128	71	—	137
France	0	4	1,900	880	35	31	12,866	9,901	46	17,357
Gr. Brit. and N. Ir.	185	181	3,419	2,806	1,407	1,283	31,255	21,552	2,150	36,306
Greece . . . . .	—	—	...	...	—	—	(2) 172	(2) 134	—	185
Italy	0	0	1,748	2,030	7	7	9,577	10,684	7	15,252
Norway	—	—	306	284	—	—	2,460	1,720	—	2,676
Netherlands	18	62	2,269	1,305	218	425	19,416	15,308	626	23,177
Poland	0	2	128	53	0	4	385	245	4	392
Portugal	—	—	66	121	—	—	1,138	761	—	1,442
Sweden	—	—	507	311	—	—	3,812	1,521	—	2,262
Switzerland	0	0	179	106	2	0	1,911	1,541	0	2,542
Czechoslovakia	0	0	1,098	997	0	0	7,423	3,422	2	5,442
Canada	0	2	181	282	7	2	2,855	4,998	4	7,573
Spain	—	—	190	132	—	—	1,224	1,155	—	1,486
China	7	0	7	0	9	2	267	0	2	0
Totals	38,239	2,839	16,487	11,972	130,738	65,910	129,342	107,591	168,694	169,096

(1) (2) (3) (4) See notes page 501.

COUNTRIES	JUNE				SIX MONTHS (January 1-June 30)				TWELVE MONTHS (January 1-Dec. 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1931	1930	1931	1930	1931	1930	1931	1930	1930	1930
Rice. — Thousand centals (1 cental = 100 lbs).										
<i>Exporting Countries:</i>										
Spain	82	139	0	0	379	615	0	0	1,252	0
Italy	161	443	4	82	1,700	2,290	26	115	4,716	134
United States	245	205	13	9	1,561	1,329	247	137	2,621	293
India	4,791	6,153	106	0	28,532	40,772	287	18	57,318	139
Indo-China	—	—	—	—	(2) 9,024	(2) 13,486	—	—	24,727	—
Siam	1,737	1,069	—	—	12,855	12,234	—	—	20,596	—
Egypt	55	82	26	11	478	569	86	137	1,206	251
<i>Importing Countries:</i>										
Germany	161	174	1,135	571	580	752	3,501	2,855	1,594	5,503
Austria	0	0	46	57	0	0	313	306	0	606
Belgium	20	0	97	106	84	4	573	527	9	1,047
Denmark	0	0	18	11	0	0	79	60	0	189
Estonia	—	—	2	4	—	—	13	15	—	35
Irish Free State	—	—	—	—	0 (2)	0 (2)	22 (2)	24	—	46
France	90	110	637	463	483	1,012	2,771	2,460	1,903	5,650
Gr. Brit. and N. Ir.	22	22	254	302	115	130	1,851	1,409	218	2,564
Greece	—	—	—	—	—	—	(2) 227 (2)	200	—	536
Hungary	0	0	26	33	0	7	249	97	9	388
Latvia	0	0	9	0	0	2	37	7	7	62
Lithuania	0	0	2	2	0	0	13	13	0	31
Norway	—	—	13	18	—	—	66	55	—	101
Netherlands	234	205	1,847	811	1,237	1,041	3,153	2,372	2,035	8,563
Poland	57	0	26	0	115	29	445	659	126	1,177
Portugal	—	—	57	73	—	—	300	434	—	941
Sweden	—	—	44	77	—	—	123	161	—	181
Switzerland	0	0	31	29	0	0	201	162	0	408
Czechoslovakia	0	0	137	117	0	0	430	465	0	979
Yugoslavia	0	0	29	31	2	0	218	170	2	516
Canada	0	0	101	77	0	0	492	414	0	584
Chile	—	—	—	—	—	—	(2) 236 (2)	257	—	518
Ceylon	4	0	736	1,074	13	4	5,075	5,811	9	10,809
Java and Madura	—	—	—	—	(2) 60 (2)	18 (2)	3,183 (2)	4,112	117	5,497
Japan	373	40	249	312	2,610	143	1,202	2,244	1,252	3,973
Syria and Lebanon	0	0	57	26	0	2	154	152	2	320
Turkey	—	—	—	—	(3) 0 (3)	0 (3)	40 (3)	44	2	203
Algeria	—	—	—	—	(4) 0 (4)	0 (4)	46 (4)	40	9	104
Tunis	0	0	2	2	0	0	18	11	0	24
Union of S. Africa	—	—	—	—	(4) 0 (4)	0 (4)	293 (4)	302	0	930
Australia	15	7	2	4	79	40	18	44	71	75
New Zealand	—	—	—	—	(2) 0 (2)	0 (2)	33 (2)	35	0	66
Totals	8,041	8,654	5,706	4,303	59,916	74,538	25,632	26,423	119,903	46,365
Linseed. — Thousand centals (1 cental = 100 lbs).										
<i>Exporting Countries:</i>										
Estonia	0	0	0	0	121	2	0	0	55	2
Lithuania	2	0	—	—	2	55	0	0	443	—
Argentina	3,512	1,276	—	—	25,201	15,181	—	—	25,496	—
India	326	1,120	0	0	1,208	3,362	0	0	5,763	0
Tunis	0	2	0	0	0	2	0	0	9	0
<i>Importing Countries:</i>										
Germany	0	4	520	423	7	20	4,577	2,895	26	5,194
Belgium	2	2	251	89	40	51	2,134	809	63	1,676
Denmark	—	—	4	4	—	—	225	181	—	659
Spain	—	—	53	22	—	—	247	172	—	419
Finland	0	0	2	11	0	0	40	37	0	79
France	0	2	567	276	11	7	2,879	1,847	15	4,253
Gr. Brit. and N. Ire.	0	0	454	379	4	7	4,154	2,053	9	6,681
Greece	—	—	—	—	(2) 0 (2)	2 (2)	37 (2)	15	2	44
Hungary	2	0	0	2	11	7	2	88	143	1,175
Italy	0	0	181	121	0	0	697	492	0	1,175
Latvia	2	2	13	4	51	53	49	55	236	45
Norway	—	—	29	11	—	—	212	187	—	32
Netherlands	2	7	822	527	42	117	5,324	2,936	146	6,252
Poland	—	0	35	18	4	15	227	97	31	320
Sweden	—	—	176	77	—	—	623	430	—	1,175
Czechoslovakia	0	0	46	9	2	4	269	201	13	320
Yugoslavia	0	0	2	9	0	2	73	55	2	320
Canada	—	35	0	57	300	110	0	441	788	1,175
United States	—	—	644	207	—	—	3,411	6,127	—	1,175
Japan	—	—	23	13	—	—	117	46	—	320
Australia	0	0	85	35	0	0	198	187	0	320
Totals	3,874	2,450	3,854	2,325	27,064	18,999	25,496	13,335	33,215	34,459

(2) (3) (4) See notes page 501.

COUNTRIES	JUNE				SIX MONTHS (January 1-June 30)				TWELVE MONTHS (January 1-Dec. 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1931	1930	1931	1930	1931	1930	1931	1930	1930	1930
Butter. — (Thousand lbs.)										
<i>Exporting Countries:</i>										
Austria	2	174	353	291	1,166	1,786	1,052	293	4,112	545
Denmark	38,481	34,372	146	0	190,579	187,294	972	822	372,558	1,389
Estonia	4,134	3,596	0	0	12,436	11,378	0	0	31,010	0
Irish Free State . . . . .	...	...	...	(2)	5,278 (2)	9,277 (2)	3,128 (2)	2,690	58,815	3,391
Finland	3,245	3,499	0	0	21,433	22,051	0	0	37,720	7
France	840	1,385	1,790	494	4,594	5,137	23,949	9,279	12,095	12,924
Hungary	112	223	0	0	701	1,561	112	0	3,430	40
Latvia	4,434	4,672	2	7	16,945	17,655	18	24	40,630	49
Lithuania	2,878	2,222	0	0	7,319	5,432	0	0	16,219	0
Netherlands	7,646	9,528	331	267	39,099	47,792	2,718	1,036	92,394	4,366
Poland	3,609	2,480	4	0	11,903	10,278	20	11	26,714	29
Sweden	3,333	4,531	0	0	23,171	30,931	4	13	58,857	18
U. S. S. R. . . . .	...	...	...	...	...	...	...	...	23,149	...
Argentina	1,003	2,392	...	...	28,444	25,743	...	...	51,156	...
India	20	31	20	20	185	309	165	132	551	232
Syria and Lebanon	421	265	0	4	996	1,037	121	37	2,161	172
Australia	3,830	3,223	0	0	93,981	57,367	0	0	126,411	2
New Zealand	15,818	17,615	...	...	114,070	122,207	...	...	208,170	...
<i>Importing Countries:</i>										
Germany	22	101	17,806	23,507	113	348	102,586	129,890	578	293,560
Belgium	287	214	3,646	1,733	1,270	1,213	13,505	10,029	2,648	22,412
Spain	11	11	11	11	51	95	33	119	161	328
Gr. Brit. and N. Irel.	725	551	84,737	76,492	21,832	7,449	446,460	404,248	21,028	764,782
Greece . . . . .	...	...	...	...	...	...	(2)	518 (2)	448	1,420
Italy	538	653	425	278	1,045	1,323	4,405	1,283	1,744	3,115
Norway	68	0	9	115	1,093	229	79	267	236	1,580
Switzerland	2	4	3,073	2,385	4	21	12,207	9,264	42	18,786
Czechoslovakia	0	9	983	101	302	448	2,200	293	694	714
Canada	1,874	86	2	2,855	2,366	399	2,813	32,710	1,179	38,605
United States	179	254	159	289	1,210	1,841	728	1,872	2,967	2,471
Ceylon . . . . .	...	...	02	42	...	...	322	401	...	723
Java and Madura . . . . .	...	...	...	...	...	...	(2)	3,740 (2)	3,080	7,557
Japan . . . . .	...	...	13	49	...	...	128	406	...	611
Algeria . . . . .	...	...	...	...	(4)	24 (4)	24 (4)	1,362 (4)	1,288	82
Egypt	9	0	240	249	15	9	1,190	1,263	42	2,417
Tunis	0	0	86	64	2	2	478	439	13	829
Totals	96,079	91,991	114,008	109,051	602,257	570,689	635,319	612,837	1,197,572	1,186,336
Cheese. — (Thousand lbs.)										
<i>Exporting Countries:</i>										
Denmark	869	615	42	60	4,575	5,862	313	340	12,626	809
Finland	522	306	2	2	3,265	1,995	13	15	4,633	35
Italy	6,989	6,572	1,032	1,470	44,229	41,998	5,139	6,014	80,780	12,562
Lithuania	227	143	0	0	1,060	701	4	4	1,060	11
Norway	227	63	35	40	969	611	300	340	1,380	760
Netherlands	19,019	19,081	99	90	91,162	97,072	604	679	209,739	1,510
Poland	227	172	77	112	1,413	1,045	408	538	3,207	1,074
Switzerland	4,705	5,853	573	377	23,724	32,847	3,063	2,275	60,146	4,251
Czechoslovakia	530	578	309	229	4,084	3,241	1,556	1,305	8,274	2,968
Yugoslavia	234	373	22	20	1,530	1,023	128	152	4,583	800
Canada	4,079	5,560	66	165	7,813	9,901	679	946	66,955	1,779
Australia	670	139	2	9	3,228	1,911	15	137	7,273	160
New Zealand	11,806	17,220	0	2	112,094	114,561	2	2	201,256	7
<i>Importing Countries:</i>										
Germany	491	243	12,804	11,640	2,933	2,471	58,110	61,688	5,410	137,459
Austria	785	256	750	611	2,804	1,219	3,294	3,124	4,432	5,637
Belgium	82	71	4,614	4,363	379	397	23,127	23,321	880	51,394
Spain	35	31	227	529	148	90	1,750	2,635	207	5,836
Irish Free State . . . . .	...	...	...	(2)	35 (2)	49 (2)	994 (2)	959	194	2,350
France	2,531	2,851	7,145	4,433	17,227	21,406	38,960	27,902	38,921	65,534
Gr. Brit. and N. Irel.	571	648	10,330	23,142	8,532	4,388	163,070	169,186	8,927	348,592
Greece . . . . .	...	...	...	(2)	104 (2)	148 (2)	1,490 (2)	1,261	262	2,302
Hungary	7	7	31	31	68	33	163	227	93	386
Portugal . . . . .	...	...	66	51	...	...	271	340	...	1,010
Sweden . . . . .	...	...	108	90	...	...	778	624	...	68,313
United States	128	165	5,121	6,098	950	1,179	30,249	40,588	2,180	7,553
India	0	0	55	60	2	2	432	470	7	1,193
Java and Madura . . . . .	...	...	...	...	...	...	(2)	593 (2)	624	1,071
Syria and Lebanon	29	18	117	42	66	97	357	328	132	780
Australia . . . . .	...	...	...	(4)	77 (4)	79 (4)	2,826 (4)	3,943	212	10,977
Egypt	2	...	628	675	33	36	5,882	5,556	60	7,553
Tunis	9	2	134	121	20	7	1,034	871	29	1,746
Totals	54,814	61,279	56,391	54,467	332,713	344,426	343,628	354,496	737,569	739,704

COUNTRIES	JUNE				ELEVEN MONTHS (August 1-June 30)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1931	1930	1931	1930	1930-31	1929-30	1930-31	1929-30	1929-30	1929-30
Cotton. — Thousand centals (1 cental = 100 lbs).										
<i>Exporting Countries:</i>										
United States	1,302	1,010	71	49	34,957	34,959	402	1,870	5,927	1,889
Argentina	68	130	—	—	368	507	—	—	597	—
Brazil	—	—	—	—	476 (4)	1,310	—	—	1,351	—
India	1,025	963	359	95	13,810	14,152	1,715	487	15,172	600
Egypt	487	227	0	0	5,950	6,188	0	0	1,367	0
<i>Importing Countries:</i>										
Germany	134	143	620	448	1,554	1,717	7,879	8,459	1,885	8,944
Austria	0	0	42	42	0	2	434	525	2	562
Belgium	24	7	148	179	174	97	1,576	1,896	106	2,037
Denmark	—	—	18	13	—	—	143	134	—	146
Spain	2	0	176	126	24	42	2,033	2,011	44	2,207
Estonia	0	0	7	4	0	0	77	123	0	130
Finland	0	0	7	9	0	2	159	130	2	143
France	40	62	390	412	496	584	7,873	7,866	668	8,054
Gr. Brit. and N. Irel.	31	62	745	626	425	721	10,417	12,771	769	13,181
Greece	—	—	—	—	(2)	0 (2)	2 (2)	170 (2)	2	68
Hungary	—	—	26	22	—	—	263	269	—	291
Italy	0	2	251	403	2	9	3,523	4,890	9	5,148
Latvia	0	0	4	4	0	0	60	73	0	77
Norway	—	—	2	2	—	—	46	44	—	46
Netherlands	0	0	86	77	4	7	961	959	7	1,027
Poland	2	2	121	90	22	26	1,340	1,107	26	1,215
Portugal	—	—	15	33	—	—	306	379	—	401
Sweden	—	—	29	33	—	—	417	474	—	516
Switzerland	0	0	37	42	0	0	560	611	0	639
Czechoslovakia	11	11	172	176	141	157	2,200	2,542	170	2,701
Yugoslavia	0	0	13	13	—	0	170	181	—	188
Canada	—	—	55	51	—	—	979	994	—	1,043
Japan	64	26	948	842	470	337	12,987	12,633	417	13,082
Algeria	—	—	—	—	11 (4)	24 (4)	2 (4)	2	33	1
Totals	3,250	2,645	4,340	3,791	58,893	60,843	56,797	61,487	63,554	64,349

COUNTRIES	JUNE				ELEVEN MONTHS (August 1-June 30)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1931	1930	1931	1930	1930-31	1929-30	1930-31	1929-30	1929-30	1929-30
Wool. — (Thousand lbs)										
<i>Exporting Countries:</i>										
Spain	357	830	1,572	875	3,448	6,700	8,601	4,334	8,062	5,781
Irish Free State	—	—	—	—	(2)	5,159 (2)	7,480 (2)	538 (2)	734	1,044
Hungary	1,894	1,883	73	76	3,922	5,963	1,478	1,252	10,013	1,561
Argentina (a)	30,768	30,823	—	—	310,768	251,562	—	—	277,801	—
Chile (b)	—	591	—	—	—	5,581	—	—	6,306	—
India	4,528	4,491	717	388	(2)	33,036 (2)	17,930	—	20,318	—
Syria and Lebanon	2,732	390	0	474	33,665	40,488	3,545	3,446	47,825	4,189
Algeria	—	—	—	—	9,035	6,561	2,756	999	7,485	1,810
Egypt	507	174	0	—	(4)	10,715 (4)	6,023 (4)	579 (4)	699	14,597
Tunis	77	79	62	152	2,800	2,236	2	2	2,538	2
Un. of S. Africa (a)	—	—	—	—	351	456	604	807	551	1,113
Un. of S. Africa (b)	—	—	—	—	(4)	247,731 (4)	246,187 (4)	33 (4)	0	288,677
Australia (a)	33,494	63,203	238	62	(4)	3,556 (4)	4,736 (4)	476 (4)	216	7,401
Australia (b)	3,254	4,976	4	0	704,353	675,169	1,908	2,670	758,152	2,387
New Zealand (a)	4,874	2,341	0	0	36,801	38,420	0	644	47,376	684
New Zealand (b)	4,773	8,885	0	0	169,798	146,138	0	11	156,771	12
<i>Importing Countries:</i>										
Germany (a)	955	324	30,813	36,460	8,369	10,214	229,563	237,249	11,188	234,117
Germany (b)	737	908	2,577	8,102	10,430	12,855	26,116	23,504	14,966	23,609
Austria	18	18	747	1,080	234	324	12,518	18,426	368	15,651
Belgium (a)	935	840	11,354	20,376	8,805	7,945	116,715	189,974	9,008	160,963
Belgium (b)	1,711	1,248	320	672	18,163	22,500	2,406	4,129	25,546	3,302
Denmark	4	2	196	232	73	115	2,897	3,076	130	2,412
Finland	0	9	146	165	53	84	2,090	1,567	86	1,322
France	8,915	4,262	89,749	56,062	44,379	49,489	423,009	429,593	55,031	546,539
Gr. Britain and N. Ir.	40,475	44,485	75,207	71,135	267,770	291,651	758,441	691,627	233,774	775,521
Greece	—	—	—	—	(2)	231 (2)	842 (2)	2,347 (2)	1,724	659
Italy (a)	134	245	7,643	13,761	1,795	1,464	86,006	83,432	2,024	2,024
Italy (b)	492	534	753	1,393	8,832	2,344	7,813	11,797	2,035	2,035
Norway	77	49	104	190	591	853	1,882	1,694	983	983
Netherlands (a)	216	231	540	985	1,925	1,706	6,221	6,604	2,112	2,112
Netherlands (b)	20	57	551	520	335	459	5,754	5,310	567	567
Poland	179	247	3,849	5,752	2,216	2,967	33,512	27,964	3,333	3,333
Sweden	—	—	1,109	1,210	—	—	12,732	13,480	—	—
Switzerland	31	33	677	1,920	295	55	16,151	15,501	53	53
Czechoslovakia	110	256	3,721	3,223	1,312	1,788	29,689	31,657	2,379	2,379
Yugoslavia	0	2	207	547	24	42	7,493	6,181	34	34
Canada	71	267	494	873	1,348	4,490	10,479	8,626	3,191	3,191
United States	212	93	16,893	8,896	1,768	1,907	180,373	184,696	2,222	2,222
Japan	0	0	13,506	11,334	42	24	106,788	73,433	24	106,788
Totals	136,300	168,372	222,811	241,862	1,969,832	1,966,332	2,114,222	2,033,036	2,162,171	2,202,439

a) = Wool, greasy; b) = Wool, scoured.
(4) See notes page 501.

COUNTRIES	JUNE		TWELVE MONTHS (July 1-June 30)		TWELVE MONTHS (July 1- June 30)	COUNTRIES	JUNE		TWELVE MONTHS (July 1-June 30)		TWELVE MONTHS (July 1- June 30)
	1931	1930	1930-31	1929-30	1929-30		1931	1930	1930-31	1929-30	1929-30
Coffee. (Thousand lbs.).						Tea. (Thousand lbs.).					
EXPORTS.						EXPORTS.					
<i>Exporting Countries:</i>						<i>Exporting Countries</i>					
Brazil . . . . .	...	...	9,130,215	9,173,589	—	Ceylon	27,128	23,589	247,397	251,280	—
India	1,340	3,812	23,483	31,693	—	India	13,825	14,013	347,399	370,146	—
Java and Madura . .	...	...	(2) 35,100	(2) 52,783	—	Java and Madura . .	...	...	(2) 144,860	(2) 142,737	—
						Japan	2,520	2,555	24,315	24,836	—
<i>Importing Countries:</i>						<i>Importing Countries:</i>					
Germany	141	22	1,345	470	—	Belgium	2	4	31	26	—
Belgium	745	93	5,080	1,041	—	Irish Free State . .	...	...	(2) 179	(2) 138	—
France	0	2	60	22	—	France	2	2	35	57	—
Netherlands	1,133	1,376	18,243	21,268	—	Gr. Brit. and N. Ir.	6,838	6,007	37,052	95,771	—
Portugal	42	57	553	571	—	Netherlands	11	4	115	53	—
Switzerland	31	22	399	227	—	United States . . .	38	44	476	631	—
Canada	4	7	55	79	—	Syria and Lebanon	4	2	18	29	—
United States	3,492	1,003	24,321	17,806	—	Algeria . . . . .	...	...	(4) 20	(4) 18	—
Ceylon	0	90	227	719	—	Union of S. Africa .	...	...	(4) 53	(4) 64	—
Syria and Lebanon	9	2	72	82	—	Australia	95	223	853	1,702	—
Australia	4	2	53	62	—	New Zealand . . . .	...	...	(2) 101	(2) 95	—
Totals	—	—	—	—	—	Totals	54,758	47,343	852,904	897,633	—
IMPORTS.						IMPORTS.					
<i>Importing Countries:</i>						<i>Importing Countries</i>					
Germany	21,400	17,375	350,362	313,803	—	Germany	630	395	12,741	12,807	—
Austria	4,184	1,702	23,268	20,034	—	Austria	238	57	1,409	1,522	—
Belgium	12,165	7,103	123,457	94,932	—	Belgium	60	49	639	617	—
Bulgaria	137	121	1,660	1,735	—	Denmark	90	97	1,296	1,195	—
Denmark	6,404	5,849	83,224	53,531	—	Spain	24	29	282	317	—
Spain	4,348	6,784	53,363	54,798	—	Estonia	11	9	146	148	—
Estonia	29	21	300	293	—	Irish Free State . .	...	...	(2) 23,072	(2) 22,024	—
Irish Free State . .	...	...	(2) 503	(2) 401	—	Finland	15	18	290	278	—
Finland	8,179	3,293	40,442	38,814	—	France	232	243	3,360	3,305	—
France	39,661	31,370	405,881	385,618	—	Gr. Britain and N.					—
Gr. Britain and N.					—	Ireland	30,923	30,170	541,616	553,356	—
Ireland	3,364	2,910	37,853	38,099	—	Greece . . . . .	...	...	(2) 611	(2) 560	—
Greece . . . . .	...	...	(2) 11,969	(2) 11,396	—	Hungary	37	22	650	714	—
Hungary	575	737	7,568	8,128	—	Italy	31	33	326	337	—
Italy	7,692	8,554	98,430	102,592	—	Latvia	11	9	168	203	—
Latvia	20	20	353	335	—	Lithuania	13	9	179	174	—
Lithuania	24	29	478	423	—	Norway	37	26	388	375	—
Norway	3,256	2,427	37,690	34,335	—	Netherlands	2,945	2,202	32,512	29,306	—
Netherlands	7,710	6,510	100,483	98,986	—	Poland	344	245	4,014	4,484	—
Poland	1,462	1,168	17,589	17,668	—	Portugal	40	64	597	686	—
Portugal	972	860	11,413	9,978	—	Rumania . . . . .	...	...	(1) 725	(1) 866	—
Rumania . . . . .	...	...	(1) 6,779	(1) 6,887	—	Sweden	71	64	928	877	—
Sweden	9,283	7,381	100,329	99,162	—	Switzerland	139	123	1,731	1,567	—
Switzerland	2,956	2,339	31,608	31,017	—	Czechoslovakia . .	64	46	1,473	1,896	—
Czechoslovakia . .	2,734	3,523	29,026	31,458	—	Yugoslavia	22	20	628	776	—
Yugoslavia	1,490	1,307	20,862	21,713	—	Canada	1,043	4,694	43,147	46,767	—
Canada	2,787	3,029	33,639	29,018	—	United States . . .	6,953	6,554	87,191	86,869	—
United States	136,910	138,296	1,728,573	1,562,080	—	Chile . . . . .	...	...	(2) 4,778	(2) 4,579	—
Chile . . . . .	...	...	(2) 9,456	(2) 11,700	—	Syria and Lebanon	11	2	361	315	—
Ceylon	174	245	3,143	3,150	—	Turkey . . . . .	...	...	(3) 1,634	(3) 1,623	—
Japan	474	333	4,473	4,004	—	Algeria . . . . .	...	...	(4) 2,490	(4) 2,141	—
Syria and Lebanon	234	201	2,732	2,504	—	Egypt	1,428	844	18,618	14,978	—
Turkey . . . . .	...	...	(3) 8,564	(3) 9,804	—	Tunis	340	231	2,952	3,144	—
Algeria . . . . .	...	...	(4) 25,576	(4) 22,011	—	Union of S. Africa .	...	...	(4) 11,853	(4) 9,440	—
Egypt	1,265	445	14,543	27,661	—	Australia	3,563	4,297	46,438	50,784	—
Tunis	271	192	3,036	3,470	—	New Zealand . . . .	...	...	(2) 12,734	(2) 11,903	—
Union of S. Africa .	...	...	(4) 26,034	(4) 26,101	—	<i>Exporting Countries:</i>					
Australia	340	198	2,619	4,253	—	India	397	401	6,232	9,323	—
New Zealand . . . .	...	...	(2) 390	(2) 450	—	Java and Madura . .	...	...	(2) 11,023	(2) 13,953	—
<i>Importing Countries:</i>						Totals	49,689	50,462	874,331	898,449	—
...	35	258	4,090	6,658	—						
Totals	375,620	349,693	3,443,323	3,191,560	—						

COUNTRIES	JUNE		NINE MONTHS (Oct. 1-June 30)		TWELVE MONTHS (Oct. 1- Sept. 30)	COUNTRIES	JUNE		ELEVEN MONTHS (August 1-June 30)		TWELVE MONTHS (August 1- July 31)
	1931	1930	1930-31	1929-30	1929-30		1931	1930	1930-31	1929-30	1929-1930
Cacao. (Thousand lbs.).						Total Wheat and Flour (*) (Thousand centals).					
EXPORTS.						a) NET EXPORTS					
<i>Exporting Countries:</i>						<i>Exporting Countries:</i>					
Grenada			(2) 6,757 (2)	7,796	9,074	Bulgaria	403	13	2,996	(5)	(5)
Dominican Republ.	13,364	7,901	35,087	31,956	42,560	Spain	11	7	95	(5)	(5)
Brazil			(2) 92,991 (2)	124,077	162,486	France	(5)	2,273	(5)	(5)	(5)
Ecuador			(2) 28,133 (2)	29,035	39,399	Hungary	800	1,219	10,476	17,097	17,494
Trinidad	9,716	4,396	58,476	45,208	54,492	Lithuania	2	18	560	58	62
Venezuela			(2) 23,204 (2)	22,798	38,773	Poland	143	49	2,432	168	117
Ceylon	527	531	7,156	6,854	8,446	Rumania		(1)	6,912 (1)	467	1,692
Java and Madura			(2) 1,288 (2)	970	2,833	U. S. S. R.		(2)	64,104 (2)	74,185 (7)	5,732
Cameroon			(2) 22,049 (2)	20,419	24,654	Yugoslavia	2	487	2,959	18,484	18,719
Ivory Coast			(2) 43,978 (2)	40,519	47,638	Canada	13,744	12,939	146,083	96,755	110,881
Gold Coast	22,582	28,947	452,465	428,188	507,506	United States	6,224	6,805	56,339	74,225	83,081
Nigeria	4,008	4,237	113,620	109,281	116,634	Argentina	12,551	5,917	69,792	87,976	90,361
St. Thomas and Principe	2,324	2,147	20,091	27,410	32,860	Chile		(2)	556 (2)	287	728
Togoland			(2) 11,585 (2)	13,647	14,357	British India	(5)	930	(5)	(5)	309
						Turkey		(3)	201	(5)	(5)
<i>Importing Countries:</i>						Algeria		(4)	5,038 (4)	2,072	2,765
Germany	0	0	432	216	216	Tunis	1,340	121	2,524	2,857	3,468
Belgium	99	13	505	209	304	Australia	10,038	3,164	82,984	34,165	36,689
France	0	0	223	37	37						
Netherlands	536	366	8,785	9,215	10,970	Totals	45,253	33,442	454,111	333,771	366,568
Poland	0	0	0	13	13						
Czechoslovakia	2	0	18	20	20						
United States	509	763	6,321	6,735	8,955						
Australia	22	13	60	216	276						
Totals	53,689	49,814	933,224	924,859	1,122,503						
IMPORTS.						b) NET IMPORTS.					
<i>Importing Countries:</i>						<i>Importing Countries:</i>					
Germany	10,763	8,647	147,593	125,042	165,548	Germany	2,601	1,215	16,039	26,769	28,744
Austria	829	686	9,191	8,278	10,030	Austria	1,069	2,077	7,831	10,196	11,407
Belgium	1,409	1,100	20,706	12,807	17,320	Belgium	3,009	2,264	24,780	23,105	25,406
Denmark	805	593	6,530	4,096	6,195	Bulgaria	(6)	(6)	(6)	875	855
Spain	1,548	1,005	20,190	16,153	18,047	Denmark	1,021	366	6,367	4,228	4,054
Estonia	31	15	340	280	366	Spain	(6)	(6)	(6)	2,048	2,053
Irish Free State			(2) 1,554 (2)	690	853	Estonia	35	42	452	635	706
Finland	13	31	176	234	304	Irish Free State		(2)	9,434 (2)	8,900	10,291
France	9,427	6,413	71,305	60,832	77,726	Finland	240	293	2,721	8,047	3,320
Gr. Brit. and N. Ir.	7,751	12,260	107,310	95,771	123,805	France	4,753	(6)	29,438	8,319	6,508
Greece			(2) 1,737 (2)	1,554	2,187	Gr. Brit. and N. Ir.	9,952	8,893	120,556	111,329	122,913
Hungary	452	183	4,365	3,719	4,700	Greece		(2)	11,599 (2)	10,882	12,998
Italy	1,155	1,389	13,314	11,878	14,903	Italy	6,453	5,280	46,980	22,130	25,402
Latvia	139	198	1,354	1,519	2,085	Latvia	57	95	878	1,274	1,490
Lithuania	33	79	580	419	553	Norway	487	311	4,597	8,746	4,048
Norway	346	419	2,952	3,979	4,993	Netherlands	1,825	2,068	19,445	18,430	18,176
Netherlands	7,249	8,508	127,079	101,689	117,851	Portugal	785	657	1,294	3,333	3,935
Poland	1,034	831	9,916	9,235	11,908	Sweden	115	234	2,789	3,801	4,395
Sweden	732	615	7,262	7,255	8,545	Switzerland	(7) 734 (7)	736 (7)	10,075 (7)	9,631 (7)	9,590
Switzerland	838	483	22,095	14,279	16,223	Czechoslovakia	820	492	8,579	7,419	7,951
Czechoslovakia	2,088	913	14,780	13,144	16,921	Ceylon	55	42	540	530	575
Yugoslavia	225	71	1,220	1,213	1,724	India	316	(6)	2,707	1,172	(6)
Canada	1,184	1,263	13,113	15,126	17,622	Indochina		(2)	494 (2)	561	732
United States	33,353	33,870	304,997	320,549	431,014	Japan	1,923	783	10,106	7,384	7,384
Australia	994	412	5,176	7,383	9,273	Java and Madura		(2)	1,120 (2)	1,291	672
New Zealand			(2) 1,030 (2)	1,120	1,876	Syria and Lebanon	2	31	82	495	495
						Turkey		(6)	(3)	495	495
Totals	82,423	79,964	916,335	838,990	1,066,528	Egypt	948	445	5,856	6,036	6,036
						Union of South Afr.		(2)	1,503 (2)	2,093	2,093
						New Zealand		(2)	379 (2)	218	218
						Totals	36,299	25,331	247,391	286,346	322,546

(*) Flour reduced to grain on the basis of the coefficient: 1,000 centals of flour = 1,333.33 centals of grain.

a) Excess of exports over imports. — b) Excess of imports over exports.

(1) Data up to 28th February. — (2) Data up to 31st May. — (3) Data up to 31st March. — (4) Data up to 30th April. — (5) Data up to 31st March.

Net Imports. — (6) See Net Exports. — (7) Wheat only.

STOCKS

Cereal Stocks.

With the present number of the "Monthly Crop Report and Agricultural Statistics" the publication of a new series of data relating to cereal stocks in Canada and the United States begins. The data, which are official and detailed, take the place of those previously published relating to visible stocks of cereals in these countries.

The new data are weekly but only those referring to the Friday (for Canada) or the Saturday (for the United States) nearest to the first of each month are published here. The data are drawn from the information published for Canada by the Agricultural Branch of the Dominion Bureau of Statistics, for the United States by the Bureau of Agricultural Economics.

Commercial visible stocks of cereals in Canada are composed of Canadian and United States cereals in elevators in Canada (for maize from other sources also). The first group comprises the following:

- (1) In country private and manufacturing elevators in the west;
- (2) In terminal and port elevators;
- (3) In transit, on rail;
- (4) On ship, to be unloaded in Canadian ports.

The second group includes United States cereals imported into Canada and in public elevators in the east (maritime and lake ports).

Commercial visible stocks in the United States refer to stocks of United States cereals and of Canadian cereals in United States entrepôts. Stocks of United States cereals include quantities stored in public and private elevators in 39 important centres, as well as quantities on ship or lighter in maritime or lake ports. Cereals in transit on rail or water, as well as stocks in mills and small stocks in private ownership for local consumption, are not included. In the stocks of Canadian and United States cereals are included quantities stored in entrepôts at maritime and lake ports but quantities in transit on the lakes and canals are excluded.

For the same countries *stocks on farms* will also be published. For Canada stocks, published by the Agricultural Branch of the Dominion Bureau of Statistics, are received on 31 March and 31 July (end of the agricultural season). For the United States the Bureau of Agricultural Economics publishes these data at dates varying according to the product; they are as follows for the different cereals:

- (a) For wheat 1 March, 1 April and 1 July (stocks of old crop);
- (b) For rye 1 March;
- (c) For barley 1 March and 1 August (stocks of old crop);
- (d) For oats 1 March and 1 August (stocks of old crop);
- (e) For maize 1 March and 1 November (stocks of old crop).

For the *United States* there are also data on *stocks of wheat in country mills and elevators* (for Canada the same data are included in visible commercial stocks of cereals) and *stocks of wheat flour in the same mills, etc.*

Stocks of wheat in country mills and elevators are received on 1 March, 1 April and 1 July. These data, supplied by the Bureau of Agricultural Economics include only stocks in country elevators and small mills in the interior in so far as these quantities are not included in the weekly reports of the Bureau for 39 centres and in the quarterly data for stocks of wheat in commercial mills, etc. As these data are rather late in being

available they will be published in the second "Monthly Crop Report" following the date to which they refer. The same applies to the quarterly data on stocks of wheat in commercial mills and annexed elevators and stocks of wheat flour in the same mills, and also to stocks in transit destined for the same mills, taken from the publications of the Bureau of the Census relating to 31 March, 30 June, 30 September and 31 December. In each case these figures are partial, including mills accounting for over 90 % of the total capacity of all commercial mills in the United States. For the years 1928 to 1930 the data inserted in the following table of "Carry-over of wheat and wheat flour in United States on 1st July" are increased according to the estimates of the Bureau of Agricultural Economics so as to represent the total in mills. Those of 1931 are incomplete, not having been increased in this way.

Along with the above-mentioned data the "Monthly Crop Report and Agricultural Statistics" will also contain a new series, of data, referring to the Saturday nearest the first of the month, for *quantities of cereals on ocean passage, with Europe as first destination*. These data are taken from the weekly statistics of Broomhall's "Corn Trade News".

The International Yearbook of Agricultural Statistics will contain as material for comparison the monthly series of cereal stocks published in the "Crop Report" since the 1927-28 season.

J. v. P. A.

QUANTITIES OF CEREALS ON OCEAN PASSAGE WITH FIRST DESTINATION FOR EUROPE.

SPECIFICATION	Saturday nearest to 1st of month					Saturday nearest to 1st of month				
	August 1931	July 1931	June 1931	August 1930	August 1929	August 1931	July 1931	June 1931	August 1930	August 1929
	1,000 centals					1,000 bushels				
Wheat (and flour in terms of wheat)	22,738	20,890	36,216	23,534	22,584	37,896	49,818	60,360	30,224	37,040
Rye	408	730	979	43	480	729	1,303	1,749	77	857
Barley	2,184	3,680	4,424	2,018	4,048	4,550	7,667	9,217	4,200	8,433
Oats	1,402	1,898	1,981	918	701	4,380	5,930	6,190	2,870	2,100
Maize	26,626	25,877	16,003	15,739	13,310	47,546	46,209	28,577	23,106	23,769

Authority: *Broomhall's Corn Trade News*.

CARRY-OVER OF WHEAT IN CANADA ON JULY, 31ST.

LOCATION	1931	1930	1929	1928	1931	1930	1929	1928
	1,000 centals				1,000 bushels			
Domestic wheat:								
in farmers' hands . . . . .	...	3,196	3,370	2,512	..	5,328	5,617	4,186
in country, private . . . . .	...	10,002	3,795	2,809	..	16,820	6,325	4,682
in terminal elevators in Western Inspection Division . . . . .	...	28,736	33,587	18,227	..	47,893	55,045	30,379
in public elevators in East . . . . .	...	12,925	12,222	11,105	...	21,375	20,370	18,509
in flour mills (estimated) . . . . .	...	4,500	4,474	3,685	...	7,500	7,457	6,142
in transit . . . . .	...	7,667	5,201	8,237	...	12,779	8,669	13,728
Total domestic Canadian carry over	80,029	67,016	62,629	46,576	133,382	111,693	104,383	77,026
U S wheat in store	13,760	2,377	1,373	1,855	22,984	8,961	2,288	2,259
General total	93,789	69,393	64,002	47,930	156,316	115,654	106,671	79,835

CARRY-OVER OF WHEAT AND WHEAT FLOUR IN UNITED STATES ON JULY, 1ST.

LOCATION	1931	1930	1929	1928	1931	1930	1929	1928
	1,000 centals				1,000 bushels			
Domestic wheat:								
In farmers hands	19,273	28,297	27,200	14,237	32,121	47,161	45,483	23,729
Commercial visible	122,505	65,596	54,265	23,152	204,175	109,327	90,442	38,687
In transit	(1) 7,319	8,824	9,742	6,536	(1) 12,198	14,706	16,237	10,893
In merchant's mills	(1) 13,085	28,002	28,067	19,152	(1) 21,805	46,070	48,270	31,020
In country mills	13,331	36,120	24,928	11,566	30,552	60,200	41,546	19,277
Flour (in terms of wheat)	7,981	9,968	10,739	10,248	13,301	16,614	17,982	17,080
Total	188,494	176,807	155,931	84,891	314,155	294,078	269,969	141,486
In other mills	11,040	7,500	(2) —	(2) —	13,400	12,500	(2) —	(2) —
Total domestic U. S. carry-over	199,534	184,307	—	—	327,555	307,178	—	—
Canadian wheat in store	3,613	9,861	13,918	6,679	6,021	16,435	23,190	11,182
General total	203,147	194,168	—	—	333,576	323,613	—	—

(1) Incomplete data, see explanation in the introduction on page 502 of this Crop Report. — (2) Data not available.

AMOUNT OF WHEAT EXPORTABLE FROM AUSTRALIA.

According to an official communication the amount of exportable wheat in the country on 1st August 1931 was 19,800,000 centals (33,000,000 bushels) against 23,000,000 (39,000,000) at the same date in 1930.

STOCKS OF BARLEY AND OATS REMAINING ON FARMS IN THE UNITED STATES ON AUGUST, 1ST.

YEAR	Barley			Oats		
	% of previous harvest	1000 centals	1000 bushels	% of previous harvest	1000 centals	1000 bushels
1931	2.0	1,802	8,754	4.9	19,596	61,937
1930	2.9	8,720	7,731	3.6	13,641	42,315
1929	4.8	8,194	37,071	6.0	27,761	39,316
1928	4.1	8,086	15,564	5.4	21,429	34,965
1927	6.7	7,962	14,774	6.5	24,432	36,733

COMMERCIAL CEREALS IN STORE IN CANADA AND THE UNITED STATES (1).

SPECIFICATION	Friday or Saturday nearest to 1st of month					Friday or Saturday nearest to 1st of month				
	August 1931	July 1931	June 1931	August 1930	August 1929	August 1931	July 1931	June 1931	August 1930	August 1929
	1,000 centals					1,000 bushels				
WHEAT :										
Canad. in Canada	63,119	64,716	75,961	51,878	49,660	105,199	107,880	126,601	86,468	82,766
U. S. in Canada	13,760	9,208	5,711	2,377	1,373	22,934	15,347	7,851	3,961	2,288
U. S. in the United States .	139,449	123,505	125,466	97,138	81,854	232,415	204,175	209,110	161,897	136,423
Canad. in the United States .	3,746	3,613	3,556	9,881	14,130	6,243	6,021	5,926	16,468	23,550
Total	220,074	200,042	200,694	161,274	147,017	366,791	333,403	349,488	268,789	245,027
RYE :										
Canad. in Canada	6,774	7,024	7,032	4,211	1,838	12,097	12,542	12,557	7,519	3,282
U. S. in Canada	1,004	928	1,070	2,106	703	1,792	1,657	1,911	3,761	1,255
U. S. in the United States .	5,509	5,687	5,935	6,761	3,704	9,337	10,155	10,599	12,073	6,614
Canad. in the United States .	1	1	1	105	221	2	2	2	187	394
Total	13,288	13,640	14,038	13,183	6,466	23,728	24,356	25,069	23,540	11,545
BARLEY :										
Canad. in Canada	4,872	5,356	7,145	3,655	3,350	10,151	11,158	14,886	18,081	6,997
U. S. in Canada	22	22	33	383	184	45	45	68	797	279
U. S. in the United States .	3,152	3,277	2,991	3,238	4,223	6,567	6,827	6,232	6,746	8,798
Canad. in the United States .	57	78	301	883	1,063	119	163	627	1,839	2,277
Total	8,103	8,733	10,470	13,159	8,809	16,882	18,193	21,813	27,413	18,351
OATS :										
Canad. in Canada	2,959	3,035	3,604	2,274	5,404	3,704	9,074	10,601	6,839	15,893
U. S. in Canada	70	165	318	376	114	207	484	936	1,106	884
U. S. in the United States .	2,565	2,416	3,098	2,913	2,774	8,017	7,550	9,681	9,102	8,068
Canad. in the United States .	4	18	76	47	109	13	55	238	146	341
Total	5,598	5,634	7,096	5,610	8,401	16,941	17,163	21,456	17,043	25,236
MAIZE :										
U. S. in Canada	109	99	557	76	422	195	176	995	135	753
others origin in Canada . . .	259	262	300	682	302	463	467	535	1,220	540
U. S. in the United States .	4,682	4,602	6,909	1,916	5,088	8,361	8,217	12,337	3,421	9,086
Total	5,050	4,963	7,766	2,875	5,812	9,019	8,860	13,867	4,776	10,379

(1) See explanation in the introduction on page 502 of this Crop Report.

GRAIN AND FLOUR STOCKS AT THE PORTS OF GREAT BRITAIN AND IRELAND (1).

PRODUCTS	First of the month					First of the month				
	August, 1931	July, 1931	June, 1931	August, 1930	August, 1929	August, 1931	July, 1931	June, 1931	August, 1930	August, 1929
	1000 centals					1000 bushels				
WHEAT :										
Grain	5,840	3,360	3,624	3,144	3,216	9,400	5,500	6,040	5,220	5,400
Flour as grain	744	624	720	744	528	1,240	1,040	1,200	1,240	840
TOTAL	6,584	3,984	4,344	3,888	3,744	10,640	6,540	7,240	6,460	6,240
Barley	640	600	460	740	720	1,233	1,250	853	1,233	1,233
Oats	784	523	512	736	780	4,250	1,650	1,800	2,300	2,300
Maize	1,586	1,684	1,968	1,272	1,844	2,742	2,829	3,514	2,274	2,274

Authority: Broomhall's Corn Trade News,

(1) Imported cereals.

STOCKS OF COTTON ON HAND IN THE UNITED STATES.

LOCATION	Last day of the month					Last day of the month				
	July, 1931	June, 1931	May, 1931	July, 1930	July, 1929	July, 1931	June, 1931	May, 1931	July, 1930	July, 1929
	1000 centals					1000 bales (counting round as half bale)				
In consuming establishments	4,761	5,411	6,019	5,754	—	905	1,131	1,258	1,183	—
In public storage and at compresses . .	21,647	23,786	23,289	14,023	—	4,524	4,971	5,494	2,878	—
TOTAL . . .	26,408	29,197	32,308	19,777	11,190	5,519	6,102	6,752	4,061	2,313

STOCKS OF COTTON AT BOMBAY AND AT ALEXANDRIA.

PORTS	Thursday nearest to 1st of month					Thursday nearest to 1st of month				
	August, 1931	July, 1931	June, 1931	August, 1930	August, 1929	August, 1931	July, 1931	June, 1931	August, 1930	August, 1929
	1000 centals					1000 bales (1 bale = 478 lbs.)				
Bombay (1)	2,805	3,439	3,789	3,680	(2) 4,063	587	719	798	770	(2) 850
Alexandria	4,414	4,671	4,770	3,542	1,600	923	977	998	741	335

Authorities: *East Indian Cotton Ass.* and *Alexandria General Produce Ass.*
 (1) Stocks held by exporters, dealers and mills. — (2) July 25, 1929.

STOCKS OF COTTON IN EUROPE.

COUNTRIES, PORTS, DESCRIPTORS	Thursday or Friday nearest to 1st of month					Thursday or Friday nearest to 1st of month				
	August, 1931	July, 1931	June, 1931	August, 1930	August, 1929	August, 1931	July, 1931	June, 1931	August, 1930	August, 1929
	1000 centals					1000 bales (1 bale = 478 lbs.)				
Great Britain:										
American	2,033	2,236	2,455	1,408	2,004	425	478	514	294	419
Argentine, Brazilian, etc.	195	191	189	441	209	41	40	39	92	44
Peruvian, etc. . . .	229	224	225	312	207	48	47	47	65	43
East Indian, etc. . .	745	800	814	308	229	156	168	170	64	48
Egyptian, Sudanese	1,304	1,363	1,348	1,390	1,257	273	286	282	291	263
Other (1)	233	244	233	300	364	49	51	49	63	76
TOTAL	4,739	5,113	5,284	4,154	4,270	992	1,070	1,101	860	893
Bremen:										
American	1,628	1,856	2,176	1,173	1,155	341	388	455	245	241
Other	67	61	53	61	32	14	13	11	13	7
TOTAL	1,695	1,917	2,229	1,234	1,187	355	401	466	258	248
Havre:										
American	1,225	1,380	1,557	529	516	256	285	320	111	108
Other	167	178	159	201	127	35	37	38	42	27
TOTAL	1,392	1,558	1,716	730	643	291	322	358	153	135
London (a):										
American	3,803	3,800	4,254	1,945	1,964	691	795	911	295	295
Argentine, Brazilian, etc.	105	106	107	82	68	22	22	23	17	14
Other	206	228	231	231	137	45	48	48	48	29
TOTAL	4,114	4,134	4,592	2,258	2,169	758	865	982	360	338
Other ports:										
Other	57	49	133	89	89	12	10	10	28	19
TOTAL	4,822	4,842	4,842	2,438	2,201	781	875	992	520	462

(1) Includes American, Argentine, etc.; W. African, and Australian. — (2) Includes Bremen, Havre, and other ports.

MONTHLY REVIEW OF PRICES (1)

PRODUCTS, MARKETS AND DESCRIPTIONS	August	August	July	July	Average (2)				
	14,	7,	31,	24,	July	August	August	Commercial	
	1931	1931	1931	1931	1931	1930	1929	1930-31	1929-30
WHEAT.									
Winnipeg: No. 1 Manitoba (cents p. 60 lbs.) . .	55 3/4	54 1/4	53	55 3/4	57 3/4	92 3/4	159 3/4	64 1/4	124 1/4
Chicago: No. 2 Hard Winter (3) (cents p. 60 lbs.) .	(4) 53 1/4	(4) 49 1/4	50 1/2	52 1/4	52 3/4	89 3/4	131	78	114 3/4
Minneapolis: No. 1 Northern (cents p. 60 lbs.) .	62 3/4	62 3/4	57 1/2	63 3/4	64 3/4	89 1/2	136	77 7/8	117 1/2
New York: No. 2 Hard Winter (3) (cents p. 60 lbs.) .	(4) 63 1/2	(4) 59 3/4	n. q.	n. q.	n. q.	97 7/8	142 3/4	n. 91 1/8	121 1/8
Buenos Aires (a); Barletta (80 kg. p. hectol. — pesos paper per quintal)	5.75	5.80	5.75	5.85	5.38	9.93	10.74	6.83	10.65
Karachi. Karachi white, 2 1/2 % barley, 1 1/2 % dirt (rupees per 656 lbs.)	18-0-0	17-10-0	16-14-0	16-2-0	16-1-2	27-5-5	42-0-0	19-15-2	30-6-9
Berlin. Home grown (Reichsmarks p. quintal) . .	(4) 21.90	(4) 18.70	(4) 19.00	n. q.	24.06	25.19	23.96	26.00	25.33
Hamburg, c. i. f. (Reichsmarks p. quintal): . .									
No. 3 Manitoba	(5) 10.37	(5) 9.86	(5) 10.37	(5) 10.96	(5) 10.92	16.50	26.33	—	21.30
No. 2 Hardwinter	8.75	8.16	8.75	9.09	9.53	15.66	22.02	n. 13.00	19.40
Barusso (79 kg. p. hectol.)	8.28	7.90	8.45	8.62	8.91	16.30	21.08	11.21	18.72
Antwerp (Belgian francs p. quintal):									
Home grown	96	100	100	100	(6) 98 1/2	n. 159	173	95 1/2	154 1/4
No. 2 Hard Winter, Gulf	(7) 73	(7) 73	(7) 80	(7) 81	—	142	195	112 1/2	171
Paris: Home grown, 75-77 kg (francs p. quintal) .	8) 159.75	157.00	154.25	163.25	163.80	168.05	143.60	175.00	139.40
London: Home grown (shillings per 504 lbs.) . .	27/-	23/6	29/6	30/-	28/6	36/8	50/7	27/1	40/10
London and Liverpool c. i. f., shipping current month (shillings p. 480 lbs.):									
South Russian (on sample)	17/10 1/2	17/4 1/2	18/9	20/-	20/8	33/7 1/2	n. q.	23/7	n. q.
No. 3 Manitoba	20/-	18/10 1/2	19/6	20/6	21/1	34/11	56/-	25/4	45/2
No. 2 Hard Winter (3)	(9) 19/3	(9) 18/6	(9) 19/6	(9) 19/9	(9) 20/5	34/2	47/4	26/4	41/5
White Pacific	19/3	19/-	19/6	20/3	20/11	34/8	48/10	26/7	42/3
Rosafe (63 1/2 lbs.), afloat	(10) 18/6	(10) 17 1/4	(10) 18 1/4	(10) 18/9	(10) 18/11	35/1	46/1	23/5	40/3
Choice White Karachi	n. q.	n. q.	20/9	22/3	21/8	35/4	51/11	27/-	42/2
Australian	(11) 20/-	19 1/4	20 1/2	20 7/8	21/5	36/8	51 1/2	25 7/8	43 1/6
Milan (b): Home grown, soft (liras p. quintal) . .	(4) (12) 87	(4) 87.00	(4) 87.00	90.00	90.90	126.50	122.15	109.10	131.30
Genoa c. i. f. (shillings p. metric ton): La Plata . .	n. 90/6	n. q.	n. q.	n. 85/-	n. 87/-	n. 151/-	200/-	110/-	184/6
RYE.									
Minneapolis: No. 2 (cents per 56 lbs.)	40	38	36	38	37 1/4	59 3/4	100 1/4	42 1/4	80 3/4
Berlin: Home grown (Reichsmarks per quintal) . .	(4) 16.80	(4) 14.76	(4) 14.65	(4) 17.35	18.21	16.74	19.15	17.23	17.04
Hamburg c. i. f.: La Plata, 74-75 kg. (R. M. p. 100 kg.)	n. q.	(14) 6.71	n. q.	n. q.	(14) 7.66	n. q.	18.56	n. 7.65	14.57
Groningen (c): Home grown (florins per quintal) .	4.25	4.25	4.22	4.22	4.23	5.60	8.82	c. 4.45	6.53
BARLEY.									
Winnipeg: No. 4 Western (cents p. 48 lbs.)	30 3/4	27 1/2	29 3/4	30 3/4	30 3/4	35 3/4	74 3/4	26 1/4	51 3/4
Chicago: Feeding (cents per 48 lbs.)	39	41	38	39	38 3/4	52 1/4	54 3/4	43 3/4	57 3/4
Berlin: Home grown, fodder (Reichsmarks per quintal)	15.50	14.80	14.20	14.75	15.75	13.97	20.00	19.52	17.40
Antwerp: Danube (francs per quintal)	69	72	74	74	(15) 75	87 1/4	149 1/2	73 3/4	107 1/2
London: English malting (shillings p. 448 pounds) .	n. q.	n. q.	n. q.	n. q.	82/6	29/8	n. q.	35/8	39/-
London and Liverpool, c. i. f., parcels (shillings per 400 lbs.):									
Danubian 3 %	14/3	14/3	n. q.	n. q.	15/8	16/11	30/-	15/2	22/8
Russian (Azoff-Black sea)	14/-	14/-	(16) 14/8	(16) 14/8	(16) 14/4	16/3	n. q.	14/6	18/11
Canadian Western, No. 4	(17) 15.6	(17) 14 10/16	(17) 15 7/8	(17) 16/-	(17) 15/11	17/10/10	32/2	(17) 15/10	n. q.
Californian malting (shillings p. 448 lbs.) . . .	31/-	30/8	30/6	31/6	31/8	27/8	37/11	27/8	32/8
Moroccan	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	22/2	n. q.	n. q.
Groningen (c): Home grown winter (fl. p. quintal) .	5.32	5.45	5.50	5.37	5.48	5.45	9.42	4.37	7.55

(a) Thursday prices. — (b) Saturday prices. — (c) Prices of preceding Tuesday.

(1) All quotations are, unless otherwise stated, for spots. — (2) The monthly averages are based on Friday quotations, the annual averages on the monthly. — (3) Quoted formerly as No. 2 Winter. — (4) New Crop. — (5) No. 2 Manitoba. — (6) July, 17; 100. — (7) No. 1 Hard Winter, Gulf. — (8) August, 13. — (9) Hard Winter on sample. — (10) 63 lbs. per bushel. — (11) South Australian. — (12) August, 12. — (13) 72/73. — (14) 72/73 kg. per hectolitre. — (15) July, 17; 75. — (16) Shipping August-September. — (17) No. 3 Western.

PRODUCTS, MARKETS AND DESCRIPTION	Average (1)							
	August 14, 1931	August 7, 1931	July 31, 1931	July 24, 1931	July 1931	August 1930	August 1929	Commercial Season
								1930-31 1929-30
OATS.								
Winnipeg: No. 2 White (cents per 34 lbs.) . . .	29 3/4	27 1/4	27 1/2	29	20 1/4	42	68 7/8	30 58 1/2
Chicago: No. 2 White (cents per 32 lbs.) . . .	24 1/2	22 1/4	23 1/2	26	26 7/8	40 1/4	46 1/8	32 7/8 44 1/8
Buenos Aires (a): Current quality (pesos paper per quintal) . . .	4.05	3.80	4.10	4.00	3.99	4.25	6.97	3.58 5.30
Berlin: Home grown (Reichsmarks per quintal) .	14.80	14.15	15.00	15.70	15.89	18.88	17.47	16.17 15.62
Paris: Home grown, black and other (francs per quintal) . . .	(2) 78.75	74.25	77.00	82.00	85.20	79.75	102.00	81.00 81.15
London: Home grown white (shillings per 336 lbs.)	20/-	20/-	20/-	20/-	20/4	18/9	26/-	18/4 21/-
London and Liverpool c. i. f. parcels (shillings p. 320 lbs.):								
Danubian (39-40 lbs.) . . .	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	22/5	n. 12/1 3) n 16/4
Plate (f. a. q.) . . .	10/9	9/7 1/2	9/6	10/3	10/8	13/10	22/5	10/9 16/1
Chilian Tawny . . .	11/-	11/-	11/6	11/6	11/8	14/-	22/7	12/- 17/3
Milan (b): spot (liras per quintal):								
Home grown . . .	(4) 66.00	68.00	66.00	66.00	66.75	70.00	84.65	73.95 80.75
Foreign imported . . .	(4) 64.00	64.00	64.00	64.00	68.00	71.10	80.00	80.40 74.30
MAIZE.								
Braila: Danube (lei per quintal) . . .	...	198	225	238	(5) 288	384	669	809 687
Chicago: No. 2 Mixed American (cents per 56 lbs.)	51 1/2	56 1/2	71 1/4	57 1/2	61	97 7/8	102 3/4	88 7/8 94 1/4
Buenos Aires (a): Yellow Plate (pesos paper per quintal) . . .	3.65	3.65	3.75	3.80	3.80	6.05	8.17	6.17 8.35
Antwerp, spot (Belgian francs per quintal):								
Hessarabian . . .	68	70	75	76	(6)(7) 75	110 3/4	n. q.	n. 97 1/4 n. q.
Cinquantino . . .	80	86	71	78	(6)(8) 76	124 1/4	161 1/4	181 1/4 173
Yellow Plate . . .	54	56	60	61 1/2	(6)(9) 62	111.00	150 1/4	109 1/4 155 1/4
London and Liverpool, parcels, c. i. f. (shillings per 480 lbs.):								
Danube . . .	(10) 16/9	16/9	n. q.	n. q.	n. q.	25/8	37.5	24/11 n. q.
Yellow Plate . . .	13/7 1/2	18/1 1/2	18/9	14/1 1/4	14/3 3/4	24/11	36/10	25/3 38/3
No. 2 White African . . .	17/6	18/-	18/6	19/6	19/-	24/5	36/11	26/- 38/8
Milan (b): Home grown (liras per quintal) . . .	(4) 49.50	49.50	49.50	49.50	49.30	76.20	87.75	71.35 97.00
RICE (CLEANED).								
Milan (b): Maratelli (lire per quintal) . . .	(4) 96.50	90.00	102.50	108.00	108.40	162.00	219.00	152.15 195.70
Rangoon: No. 2 Burma (rupees per 7500 lbs.) .	295	280	265	245	230 1/2	424	482	303 3/4 462 1/4
Saloon (Indochinese piastres (11) p. quintal):								
No. 1 Round white (25 % broken) . . .	9.27	8.40	7.08	6.67	n. 6.48	12.10	11.82	11.36 11.58
No. 2 Japan (40 % broken) . . .	8.77	7.91	6.51	6.18	5.90	11.68	11.33	10.80 11.06
London (a): c. i. f. (shillings per 112 lbs.):								
Spanish Belloch, No. 3 oiled . . .	10/7 1/2	10/10 1/2	10/10 1/2	11/-	11/3	13/7	17/2	14/1 17/11
Italian good, No. 6 oiled . . .	n. q.	n. q.	n. q.	n. q.	n. q.	15/7	18/6	14/11 18/9
American Blue Rose . . .	17/6	17/9	17/9	18/-	17/11	21/10	23/3	21/9 21/10
Burma, No. 2 . . .	n. 9/1 1/4	n. 8/9	7/10 1/2	7/8 1/2	7/2	11/8	18/5	10/11 18/2
Saloon, No. 1 . . .	n. 9/6	n. 8/10 1/2	n. 8/-	n. 7/9	7/5	11/11	18/7	11/6 13/8
Siam, Garden, No. 1 . . .	n. 10/10 1/2	n. 9/3	n. 8/10 1/2	n. 8/-	8/-	14/11	n. q.	14/- 15/1
Tokyo: Various qualities (yens per koku) . . .	22.07	21.30	21.00	21.10	19.94	30.47	23.88	26.57 28.06
LANSEED.								
London: Current quality (pesos paper per quintal) . . .	11.35	11.30	11.80	11.75	11.81	17.55	19.61	17.19 18.20
Buenos Aires: Current quality (pesos paper per quintal) . . .	142	162	165	159	(12) 161	276	840	284 1/4 318 1/4
London: Current quality (p. a. ton) . . .	8-6-0	8-2-6	8-12-6	8-12-6	8-16-6	15-11-9	19-15-9	15-0-5 18-5-0
London: Current quality (p. a. ton) . . .	11-5-0	11-5-0	11-17-6	11-18-9	11-19-0	18-6-6	21-7-6	17-14-4 20-10-1
London: Current quality (p. a. ton) . . .	141 1/4	140 1/4	159 1/4	168 1/4	162 1/4	207 1/4	290	286 278 1/4

— (1) Average of the monthly averages for the period indicated. — (2) August, 1931.

— (3) July, 1931. — (4) July, 1931. — (5) July, 1931. — (6) July, 1931.

— (7) July, 1931. — (8) July, 1931. — (9) July, 1931. — (10) July, 1931.

— (11) July, 1931. — (12) July, 1931. — (13) July, 1931. — (14) July, 1931.

— (15) July, 1931. — (16) July, 1931. — (17) July, 1931. — (18) July, 1931.

— (19) July, 1931. — (20) July, 1931. — (21) July, 1931. — (22) July, 1931.

— (23) July, 1931. — (24) July, 1931. — (25) July, 1931. — (26) July, 1931.

— (27) July, 1931. — (28) July, 1931. — (29) July, 1931. — (30) July, 1931.

— (31) July, 1931. — (32) July, 1931. — (33) July, 1931. — (34) July, 1931.

PRODUCTS, MARKETS AND DESCRIPTION	August	August	July	July	Average (1)				Commercial Season	1929-30	1928-29
	14,	7,	31,	24,	July,	August	August				
	1931	1931	1931	1931	1931	1930	1929				
COTTONSEED.											
Alexandria: Sakellaridis (piastres per ardeb) . . .	40 2	30.4	42.7	45.8	46.2	62.3	100.2		67.9	95.4	
Hull. Sakellaridis (p. sterl. per long ton)	4-12-6	4-11-3	4-15-0	4-17-6	4-19-0	6-12-2	10-2-0		6-18-2	9-12-2	
COTTON.											
New Orleans: Middling (cents per lb.)	(2) 6.85	7.83	8.25	8.87	9.00	11.49	18 53		10.07	16.17	
New York: Middling (cents per lb.)	(2) 7.00	7.95	8.12	9.00	9.22	11.96	18.61		10.38	16.60	
Bombay: M g Broach f g (rupees per 784 lbs.)	142	156	170	177	177	195 ¼	335 ¼		191 ¾	283 ½	
Alexandria (a) (talaris per kantar):											
Sakellaridis f. g. f.	10 77	12.12	12 52	13.32	13.76	n. 26 ¾	32 ¾		17.12	28 ¾	
Ashmouni (Upper Egypt) f. g. f.	7.65	8.40	8.95	9.95	10.18	17 ¾	20 ¾		12.00	19 ¾	
Bremen: Middling (U S. cents per lb.)	8 17	9.14	9.75	10 47	10.55	13 66	20.99		11.59	18.27	
M. g. Broach fully good (pence per lb.)	n. 3.60	n. 3.90	n. 4.15	n. 4.35	n. 4.30	n. 4.72	n. 8.02		n. 4.63	n. 6.83	
Le Havre: Middling, Gulf (francs per 50 kilogr.)	232	257	283	303	312	397	627		349	545	
Liverpool (pence per lb.):											
Middling fair	n. 5.00	n. 5.49	n. 5.82	n. 6.18	n. 6.26	n. 8.27	n. 11.61		n. 6.93	n. 10.39	
Middling	3 80	4.29	4.62	4 98	5.06	6.95	10.36		5.72	9.09	
São Paulo, good fair	4 00	4.49	4 82	5.18	5.26	6.71	10 21		5.91	9.02	
M. g. Broach, fully good	n. 3.15	n. 3.48	n. 3.94	n. 4.14	n. 4.16	n. 4.40	n. 8.36		n. 4.25	n. 6.20	
Sakellaridis, fully good fair	5.75	6.55	6 95	7.50	7.68	11 45	16.80		9.08	14.52	
BUTTER.											
Copenhagen (a) (Kr. p. rook kg.)	202	185	182	190	190	243	298		245	308	
Maastricht, auction (b): Dutch (florins p. kg.)	1.34	1.28	1.28	1.31	(3) 1.34	1.64	1.99		1.70	2.09	
Hamburg, auction (b): Schleswig-Holstein butter, with quality mark (R. M. per 50 kg.)	132.42	124.61	128.86	131.04	(4) 126.49	144.66	171.37		146.67	178.03	
Kempten (b): Allgäu butter (Pfennige p. half kg)	109	107	114	119	113	128 ½	156		128	159	
London (c) (shillings p. cwt.):											
British blended	140/-	140/-	140/-	140/-	140/-	154/-	186/8		158/8	196/-	
Danish	122/-	120/-	123/-	124/-	121/10	152/10	177/10		153/8	186/6	
Irish creamery, salted	117/-	119/-	120/-	120/-	119/2	142/10	175/-		134/10	179/4	
Dutch	120/-	120/-	120/-	122/-	119/7	147/5	187/7		151/11	182/4	
Argentine	114/-	116/-	117/-	118/-	116/7	135/7	168/5		135/10	174/1	
Siberian	n. q.	n. q.	n. q.	n. q.	n. q.	137/-	164/5		n. 133/10	187/2	
Australian, salted	112/-	113/-	114/-	114/-	113/2	140/2	172/10		135/8	176/-	
New Zealand, salted	116/-	118/-	120/-	120/-	118/10	142/5	176/10		137/8	178/9	
CHEESE.											
Milan (lire per quintal):											
Parmigiano-Reggiano, 1st quality of last year's production	1,225	1,225	1,225	1,175	1,185	1,295	1,087		1,160	1,074	
Green Gorgonzola, mature, choice	575	575	575	575	575	592	770		671	829	
Rome: Roman pecorino choice (lire p. quintal) .	1,075	1,112	1,175	1,175	1,175	1,187	1,500		1,207	1,546	
Alkmaar: Edam 40 + 40% butterfat, with the country's cheesemark, factory cheese, small: florins, p. 50 kg.)	38.00	39.00	38.00	37.50	(5) 37.70	42.40	47.19		40.83	47.10	
Gouda (6): Gouda 45 + (whole milk cheese, with the country's cheesemark, home made; florins, p. 50 kg.)	39.50	39.50	41.00	41.50	(7) 41.40	47.40	51.76		45.56	52.45	
Kempten (b): (Pfennige per half kg.):											
Soft cheese, green (20 % butterfat)	28 ½	28 ½	28 ½	25 ½	24 ½	35	41		27	35	
Emmenthal from the Allgäu (whole milk cheese) 1st quality	100 ½	100 ½	100 ½	100 ½	100 ½	(8) 96 ½	107 ½		(9) 97	(8) 107	
London (a) (shillings per cwt.):											
English Cheddar	(9) 98/-	(9) 99/-	102/-	102/-	102/-	94/-	104/-		103/4	121/8	
Canadian	(9) 65/-	(9) 65/-	77/-	78/6	78/8	85/7	96/1		83/11	107/6	
New Zealand	65/-	65/-	66/6	65/8	62/11	83/4	92/6		82/2	95/6	
Liverpool (c): Engl. Cheshire, ungraded (sh. p. cwt.)	77/-	77/-	81/8	81/8	76/1	80/6	88/8		84/5	111/8	

(a) Thursday prices. — (b) Wednesday prices. — (c) Average prices for weeks ending on preceding Wednesday.

(1) The monthly averages are based on Friday quotations, the annual averages on the monthly. — (2) August, 13. — (3) July, 15: 1.38. — (4) July, 25: 126.96. — (5) July, 27: 37.00. — (6) Indicated formerly as: Bodegraven. — (7) July, 17: 41.50. — (8) Average prices for all qualities. — (9) New.

THE PRICES OF AGRICULTURAL PRODUCTS IN JULY, 1931

In the following pages the index-numbers of prices of agricultural products and other price indices of interest to the farmer are given as published in the different countries. The indices collected together have been obtained according to different methods and criteria in the various countries. A detailed account of the items included in each series and the system of construction of the index-numbers may be found in the volume published especially for this purpose by the Institute, entitled « Index-numbers of prices of agricultural products and other price indices of interest to the farmer ». We refer the reader to this volume for an exact interpretation of the significance of the different series of data.

Owing to the substantial divergence which often exists in the value and significance of the indices available, much care is advisable in their utilization from an international point of view. For this reason it has been considered opportune to reproduce all the data in their original form only, without attempting to formally unite them. The latter process, by a comparison of often heterogeneous data, might easily lead to the drawing of erroneous relations and conclusions.

But in addition to the original data, and subject to the above comments, a summary tables is given below.

Countries	Percentage variations in the index-numbers for July, 1931			
	compared with those for June, 1931		compared with those for July, 1930	
	Index-numbers of prices of agricultural products	General index-numbers of prices	Index-numbers of prices of agricultural products	General index-numbers of prices
Germany	— 1.8	— 0.5	— 8.2	— 10.7
England and Wales	— 1.6	— 3.3	— 9.7	— 15.5
Argentina	+ 0.2	—	— 28.7	—
Canada	— 2.6	— 0.7	— 30.6	— 15.9
Estonia	— 2.7	—	— 10.1	—
United States ^{a)}	— 1.3	—	— 28.8	—
Finland ^{b)}	— 0.8	0	— 21.9	— 16.7
Hungary	+ 1.4	— 1.2	— 17.4	— 8.9
Italy	+ 6.1	+ 4.4	— 1.1	— 4.0
New Zealand	— 3.2	— 16.0	— 16.7	— 29.3
Netherlands	+ 0.8	—	— 23.1	—
Poland	— 2.8	—	— 11.5	—
Yugoslavia	— 7.9	— 3.5	— 17.5	— 15.9
	^{c)} + 1.4	+ 0.8	^{a)} — 18.4	—
	^{d)} + 4.2		^{d)} — 23.5	— 16.2

a) "Bureau of Agricultural Economics". — b) "Bureau of Labor". — c) Products of the soil. — d) Animal products.

INDEX-NUMBERS OF PRICES OF AGRICULTURAL PRODUCTS AND OF COMMODITIES BOUGHT BY THE FARMER *

COUNTRIES AND CLASSIFICATION	July	June	May	April	March	Febr.	July	July	Year	
	1931	1931	1931	1931	1931	1931	1930	1929	1930 (1)	1929
GERMANY (Statistisches Reichsamt) 1913 = 100.										
Foodstuffs of vegetable origin	126.1	129.8	131.8	129.7	121.0	114.1	119.7	130.9	115.3	126.3
Livestock	81.7	81.5	83.9	83.3	86.7	90.6	111.9	133.7	112.4	126.6
Livestock products	105.6	103.3	102.5	105.7	113.0	119.9	121.3	135.9	121.7	142.1
Feeding stuffs	104.7	114.5	120.0	113.9	102.7	93.0	97.1	126.5	98.2	125.9
Total agricultural products	105.4	107.3	108.2	108.3	106.7	105.9	114.8	132.4	113.1	130.2
Fertilizers	73.2	77.9	77.2	80.1	82.7	83.1	77.8	80.7	82.4	84.5
Agricultural dead stock	129.9	130.0	130.6	131.2	132.4	133.3	139.6	141.2	139.4	141.3
General index-number	111.7	112.3	113.3	113.7	113.9	114.0	125.1	137.8	124.6	137.2
ENGLAND AND WALES (Ministry of Agriculture) Average of corresponding months 1911-13 = 100										
Agricultural products	121	123	122	123	123	126	134	141	134	144
Feeding stuffs	81	82	87	88	85	77	94	144	96	139
Fertilizers	100	100	100	100	100	100	103	102	101	100
General index-number (2).	98.9	97.1	96.7	96.3	100.6	100.6	111.1	135.4	114.1	135.3
ARGENTINA (Banco de la Nación argentina) 1926 = 100.										
Cereals and linseed	55.1	54.5	54.3	51.2	53.2	54.5	84.3	104.3	82.3	100.4
Meat	92.5	93.8	89.8	93.7	94.2	94.6	113.9	117.0	110.9	113.6
Hides and skins	63.1	64.1	63.1	70.5	70.1	70.0	70.5	94.2	71.6	95.0
Wool	52.4	54.3	57.6	57.7	64.5	55.2	70.4	103.3	67.4	103.5
Dairy products	84.0	74.6	73.4	73.6	74.3	72.9	80.3	106.0	82.4	106.9
Forest products	107.1	108.7	103.7	103.7	103.7	103.7	106.9	111.3	107.9	111.5
Total agricultural products	62.9	62.8	62.6	61.4	63.2	63.4	88.2	105.9	85.5	102.6
CANADA (Internal Trade Branch of the Dominion Bureau of Statistics) 1926 = 100.										
Field products (grain, etc.)	44.8	47.3	43.2	47.3	44.1	45.0	72.1	105.8	70.0	93.3
Animals and animal products	73.2	73.1	73.9	81.3	84.7	87.5	82.3	109.4	102.9	112.6
Total Canadian farm products	55.4	56.9	58.9	60.2	59.3	60.9	79.8	107.1	82.3	102.3
Fertilizers	86.9	86.9	86.9	86.5	86.5	89.4	91.5	96.3	83.2	92.6
General index-number	71.7	72.2	73.0	74.4	75.1	78.0	86.3	96.0	86.8	95.3
ESTONIA (Central Bureau of Statistics) 1922 = 100.										
Commodities imported	92	96	91	90	81	83	72	94.3	79	83
Commodities exported	62	64	62	63	63	66	88	109.1	84	88
Agricultural products imported and exported	71	73	71	72	72	72	79	106.6	79	83

* For an explanation of the method of calculation of the index-numbers, reference should be made to the Institute's publication "Index-numbers of Prices of Agricultural Products and other Price-indices of interest to the Farmer" (Rome, 1930).
(1) Some data are provisional. — (2) Calculated by the "Statist", reduced to base-year 1913 = 100.

COUNTRIES AND CLASSIFICATION	July	June	May	April	March	Febr.	July	July	Year	
	1931	1931	1931	1931	1931	1931	1930	1929	1930	1929
UNITED STATES (Bureau of Agricultural Economics) Average 1909-10 to 1913-14 = 100.										
Cereals	57	67	74	74	74	75	92	122	100	121
Fruits and vegetables	110	114	119	120	100	109	173	136	158	138
Meat animals	92	91	99	106	106	108	127	107	134	156
Dairy products	85	86	91	99	101	101	115	135	123	140
Poultry and poultry products	83	81	77	90	92	79	101	143	126	159
Cotton and cottonseed	71	65	74	78	80	76	99	145	102	145
Total agricultural products	79	80	86	91	91	90	111	140	117	138
Commodities purchased by farmers (1)	129	61	131	134	136	137	149	155	146	155
Agricultural wages (1)	—	123	—	—	127	—	100	173	152	170
UNITED STATES (Bureau of Labor) 1926 = 100.										
Grains	49.0	56.0	59.6	59.5	59.3	60.4	74.1	102.2	58.3	97.4
Livestock and poultry	69.0	61.9	64.1	70.3	70.7	69.6	81.8	114.0	89.2	106.1
Other farm products	71.3	70.8	71.5	73.4	74.2	73.7	86.9	104.5	91.1	106.6
Total farm products	64.9	65.4	67.1	70.1	70.6	70.1	83.1	107.6	88.3	104.9
Agricultural implements	94.5	94.6	94.7	94.7	91.7	94.7	94.0	98.3	95.1	97.9
Fertilizer materials	78.7	79.3	80.5	80.6	80.8	81.1	84.3	90.7	85.6	92.1
Mixed fertilizers	80.2	82.4	82.8	83.5	83.8	86.1	93.1	97.3	93.0	97.2
Cattle feed	55.8	61.1	67.9	81.2	82.1	71.6	94.8	120.5	99.7	121.6
Non-agricultural commodities	71.5	71.4	72.6	71.3	75.7	77.1	84.4	95.5	85.9	94.4
General index-number	70.0	70.0	71.3	73.3	74.5	75.5	81.0	98.0	86.3	96.5
FINLAND (Central Bureau of Statistics) 1926 = 100.										
Cereals	79	73	79	76	74	74	75	102	70	98
Potatoes	101	73	68	69	73	68	93	180	76	148
Fodder	65	65	67	71	70	62	65	67	62	69
Meat	65	66	67	66	73	73	98	104	88	103
Dairy products	70	70	71	73	74	75	87	98	84	103
Total agricultural products	71	70	71	73	75	74	86	98	82	100
General index-number	82	83	84	85	86	86	90	97	90	93
HUNGARY (Central Bureau of Statistics) 1913 = 100.										
Agricultural and livestock products	87	82	85	81	84	80	88	114	—	—
General index-number	95	91	93	93	94	92	99	110	—	—
ITALY (Consiglio Provinciale dell'Economia di Milano) 1913 = 100.										
Total agricultural products	387.03	348.32	357.28	356.96	345.90	348.75	—	—	—	503.78
General index-number	387.43	339.23	347.16	358.10	356.18	357.75	—	—	—	480.22
NETHERLANDS (Central Bureau of Statistics) 1920 = 100.										
Meat products	96.7	88.8	93.6	89.4	104.3	102.0	123.9	138.5	120.7	145.7
Meat	128.0	125.7	123.5	123.1	125.4	142.4	160.2	176.9	164.7	175.5
Wool	73.2	74.2	76.7	76.6	60.3	55.7	105.8	165.9	100.7	170.6
Wool and woolen goods	83.4	89.2	95.1	84.0	78.4	96.0	130.9	198.1	145.4	185.6
Woolen goods	122.1	120.2	130.7	124.1	144.0	122.9	125.2	153.9	124.0	148.7
Woolen goods and accessories	122.1	120.2	130.7	124.1	144.0	122.9	125.2	153.9	124.0	148.7

COUNTRIES AND CLASSIFICATION	July	June	May	April	March	Febr.	July	July	Year	
	1931	1931	1931	1931	1931	1931	1930	1929	1930 (1)	1929
NORWAY										
(Kgl. Selskap for Norges Vel)										
Average 1909-14 = 100.										
Cereals	111	108	107	105	104	104	125	165	(2) 114	(2) 155
Potatoes	257	165	157	167	181	181	130	165	(2) 152	(2) 120
Pork	83	76	73	74	81	84	96	143	(2) 98	(2) 141
Other meat	160	153	166	162	172	182	218	212	(2) 198	(2) 199
Eggs	81	77	88	85	124	101	108	119	(2) 121	(2) 135
Dairy products	125	126	124	133	135	138	156	154	(2) 150	(2) 161
Concentrated feeding stuffs	103	105	108	111	108	103	121	154	(2) 117	(2) 148
Maize	81	87	85	85	83	81	108	156	(2) 108	(2) 148
Fertilizers	96	96	96	96	96	96	105	101	(2) 101	(2) 108
NETHERLANDS										
(Directie van den Landbouw)										
Average 1924-25 to 1928-29 = 100.										
Products of the soil	67	71	83	78	71	66	42	74	(3) 68	(3) 87
Animal products	70	71	72	74	74	74	88	101	(3) 95	(3) 98
Total agricultural products	69	71	74	75	73	72	78	94	(3) 88	(3) 95
Agricultural wages	95	95	95	95	100	100	100	100	(3) 100	(3) 100
General index-number (4)		67.7	69.0	69.0	69.7	70.4	77.8	95	79.2	96.1
POLAND										
(Central Bureau of Statistics)										
1927 = 100.										
Products of the soil . . . . .	...	62.8	63.8	64.7	50.8	45.8	56.7	78.1	52.1	78.1
Products of agricultural industry . . . . .	...	73.2	77.2	75.4	63.4	59.8	78.4	83.0	69.9	80.9
Total products of plant origin	56.0	68.1	73.1	70.3	57.1	52.6	66.0	77.9	60.5	76.9
Animals . . . . .	...	60.7	56.2	55.9	58.0	58.9	81.6	102.3	82.4	98.4
Dairy products . . . . .	...	57.5	65.1	61.6	74.0	80.1	74.9	89.5	81.5	102.9
Total products of animal origin	63.8	59.3	60.1	58.5	64.8	67.7	78.6	98.4	81.9	100.2
Total agricultural products	58.8	63.8	66.8	64.5	59.8	58.2	71.8	85.1	68.5	85.7
Fertilizers . . . . .	...	118.5	124.7	124.7	124.7	124.7	126.2	130.6	127.8	126.5
Industrial products	80.6	80.8	81.0	82.1	83.4	88.9	94.2	103.4	94.0	108.3
General index-number	70.6	78.2	74.6	74.1	72.5	72.1	88.8	95.5	82.3	95.7
YUGOSLAVIA										
(National Bank)										
of the Kingdom of Yugoslavia)										
1926 = 100.										
Products of the soil	78.9	77.8	80.5	77.6	73.8	73.5	96.7	109.6	89.3	118.6
Animal products	74.7	71.7	73.2	75.4	77.4	78.1	97.7	118.8	93.8	107.2
Industrial products	71.3	71.7	73.0	73.9	72.6	72.1	80.7	91.8	81.8	92.6
General index-number	74.4	73.8	75.4	75.5	74.8	74.8	88.8	99.7	88.6	100.5

(1) Some data are provisional. — (2) Agricultural year April 1-March 31. — (3) Agricultural year July 1-June 30. — (4) Calculated by the Central Statistical Bureau of the Netherlands, reduced to the base 1925-1929 = 100.

RATES OF FREIGHT

(Rates for full cargoes).

VOYAGES	August	August	July	July	Average				
	14,	7,	31,	24,	July	August	August	Commercial	
	1931	1931	1931	1931	1931	1930	1929	Season	
									1930-31 1929-30
SHIPMENTS OF WHEAT AND MAIZE.									
Danube to Antwerp/Hamburg	13/6	13/6	13/6	13/6	13/6	14/2	17/8	13/11	15/8
Black Sea to Antwerp/Hamburg	10/3	10/3	10/3	10/3	10/3	11/-	n. q.	10/10	n. q.
St. John to Liverpool (1)	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	1/6	1/6
Montreal to United Kingdom	1/6	1/9	1/9	1/9	1/7	2/-	2/-	1/10	1/10
Gulf to United Kingdom	2/8	2/6	2/9	2/6	2/6	2/10	3/3	2/3	2/6
New York to Liverpool (1)	1/6	1/6	1/6	1/6	1/6	1/6	1/6	1/6	1/6
Northern Range to U.K. and Continent	n. q.	n. q.	n. q.	n. q.	1/9	n. q.	n. q.	1/9	1/9
North Pacific to United Kingdom (shell. per 2240 lbs).	21/-	21/-	21/-	21/-	21/-	21/10	23/6	22/3	22/7
Vancouver to Yokohama (1) (dollars p. sh. ton)	2.75	2.75	2.65	2.65	5) 2.62	2.60	3.00	2.72	2.78
La Plata Down River (2) to U. K./Continent	17/6	17/-	17/-	15/6	15/8	17/6	20/10	16/4	12/8
La Plata Up River (3) to U. K./Continent	19/-	18/6	18/6	17/-	17/3	19/3	22/4	18/-	14/4
Karachi to U. K./Continent (4)	18/8	18/8	18/8	18/2	18/11	17/11	n. c.	19/3	n. 15/4
Western Australia to U. K./Continent	26/-	26/-	26/-	26/-	26/1	30/6	29/4	29/8	25/7
SHIPMENTS OF RICE.									1930 1929
Salon to Europe	n. q.	n. 20/-	22/-	24/-	23/6	1) n. 14/-	n. 25/8	n. 18/11	n. 26/1
Burma to U. K./Continent	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	n. 23/6	n. 17/8	n. q.

(1) Rates for parcels by liners. — (2) "Down River", includes the ports Buenos Aires and La Plata. — (3) "Up River", includes the ports on the Paraná River as far as San Lorenzo. Cargoes from ports beyond San Lorenzo (Colastine, Santa-Fé and Paraná) are subject to an extra rate of freight. — (4) The original data being quoted in "scale terms", 10 % is added to arrive at freights per 2,240 lbs. — (5) 17 juillet: 2,65.

IMPORT DUTIES ON CEREALS AND FLOUR

CHANGES

TO BE MADE IN THE DUTIES PUBLISHED ON PAGE 428 OF THE CROP REPORT OF JULY, 1931.

COUNTRY	PRODUCT	Date when enforced	Original data per metric quintal	Data in Amer. cents per bushel or barrel
Estonia	Wheat	July, 20	E. cr. 42.00	159.68
"	Rye	"	" 5.00	33.36
"	Barley	"	" 15.00	87.07
"	Oats	"	" 4.00	15.48
"	Maize	"	" 10.00	67.72
"	Wheat flour, unbolted	"	" 36.00	589.27
"	Wheat flour, bolted	"	" 58.00	1,874.76
"	Rye flour, unbolted and bolted	"	" 10.00	237.02
Italy	Rye	July, 9	lires 36.50	48.54
"	Rye flour	"	" 50.00	236.89
"	Wheat	August, 19	" 75.00	106.86
"	Maize, white	"	" 75.00	99.78
"	Wheat flour	"	" 112.35	522.89
Czechoslovakia	Oats (1)	July, 9	Cz. cr. 36.00	15.47
"	Oats (2)	July, 25	—	—
"	Rye	August, 1	Cz. cr. 55.00	41.89
"	Barley	"	" 68.00	43.88
"	Wheat and rye flour	"	" 109.00	237.12

(1) Import only by special licence. — (2) Embargo on imports save by special licence.

Prof. ALESSANDRO BRIZI, Segretario Generale dell'Istituto, Direttore responsabile.

MONTHLY CROP REPORT

AND AGRICULTURAL STATISTICS

The following notes refer to crop conditions quoted in the crop reports and in the tables. — Crop condition according to the system of the country: Germany, Austria, Hungary, Luxemburg and Czechoslovakia: 1 = excellent, 2 = good, 3 = average, 4 = bad, 5 = very bad; France: 100 = excellent, 70 = good, 60 = fairly good, 50 = average, 30 = bad; Lithuania, Poland, Sweden and Switzerland: 5 = excellent, 4 = good, 3 = average, 2 = bad, 1 = very bad; Netherlands: 90 = excellent, 70 = good, 60 = fairly good, 50 = below average; U. S. S. R.: 5 = good, 4 = above the average, 3 = average, 2 = below average, 1 = bad; United States: 100 = crop condition which promises a normal yield. — For other countries the system of the Institute is employed: 100 = crop condition which promises a yield equal to the average of the last ten years.

CEREALS

The prevalently wet weather after the beginning of August hindered cutting and had an unfavourable influence on quantity and particularly on quality of the product in many European countries where harvesting had not yet been effected, especially in Germany, Belgium, Holland, France and in the more elevated regions of Austria and Czechoslovakia. Conditions more favourable to cutting prevailed in Poland.

The data available concerning production in a number of countries which together produced last year about 4/5 of the European production of wheat and barley, over 90 % of that of rye and about 2/3 of that of oats, give the following totals:

Production in Europe.

Crops	1931	1930	1929	1928	1927	1926	1925
(Million centals).							
Wheat (18 countries) . .	635	650	636	649	571	586	617
Rye (18 countries) . . .	393	478	485	468	415	392	486
Barley (18 countries) . .	268	296	320	289	254	260	257
Oats (17 countries) . . .	376	371	451	415	376	380	361
(Million bushels).							
Wheat (18 countries) . .	1,059	1,033	1,061	1,081	951	943	1,028
Rye (18 countries) . . .	702	853	867	835	740	699	867
Barley (18 countries) . .	558	617	667	602	529	542	536
Oats (17 countries) . . .	1,174	1,159	1,411	1,293	1,175	1,219	1,129

Taking account also of information received from countries which have not yet reported quantitative estimates of production — France being the most important of these — it may be calculated approximately that the total European production this year will be near to 820 million centals (1,370 million bushels) of wheat, 430 (770) of rye, 330 (690) of barley and 570 (1,780) of oats. The crop would therefore be nearly equal to that of last year in the case of wheat, smaller by about 90 million centals (155 million bushels) for rye and by about 35 (70) for barley and larger by about 20 million centals (55 million bushels) for oats. Compared with the average of the five years 1925-29 there would be an increase of about 15 million centals (25 million bushels) for wheat,

but a diminution of about 60 million centals (105 million bushels) for rye, of about 10 (25) for barley and about 20 (70) for oats.

Decidedly deficient crops have been obtained in North America, where winter wheat has given high yields, but the prolonged drought has greatly reduced the yield of spring cereals in both Canada and the United States. The estimates revised in September, however, for wheat and oats show results on the whole slightly better than these forecasted in the preceding month.

Production in North America.

Crops	1931	1930	1929	1928	1927	1926	1925
(million centals)							
Wheat (1)	704	763	675	806	822	740	649
Rye (2)	25	39	31	32	41	30	31
Barley (2)	137	226	194	237	174	137	144
Oats (2)	487	573	480	614	528	529	613
(million bushels)							
Wheat (1)	1,173	1,272	1,125	1,493	1,370	1,249	1,081
Rye (2)	44	70	55	58	74	53	56
Barley (2)	285	470	405	494	363	285	301
Oats (2)	1,522	1,808	1,529	1,920	1,650	1,654	1,915

(1) Canada, United States and Mexico. — (2) Canada and the United States.

The known data of Asiatic production have remained nearly the same :

Production in Asia.

Crops	1931	1930	1929	1928	1927	1926	1925
(million centals)							
Wheat (4 countries) . .	240	289	226	202	233	226	220
Barley (3 countries) . .	61	64	68	62	64	65	66
(million bushels)							
Wheat (4 countries) . .	400	448	376	337	388	377	382
Barley (3 countries) . .	128	134	142	120	133	135	138

The data relative to North Africa remain unchanged :

Production in North Africa.

Crops	1931	1930	1929	1928	1927	1926	1925
(million centals)							
Wheat (4 countries) . .	42	38	46	48	37	37	44
Barley (4 countries) . .	40	39	48	48	33	34	48
Oats (3 countries) . . .	4	7	7	6	4	4	6
(million bushels)							
Wheat (4 countries) . .	70	64	77	72	61	62	73
Barley (4 countries) . .	84	82	99	101	80	70	101
Oats (3 countries) . . .	14	21	22	19	14	12	20

Combining all the available estimates of world production, which now include a total of countries which last year contributed about 9/10 of the total production of the northern hemisphere (excluding the U. S. S. R. and China) of wheat and rye, and about 85 % of barley and oats, the following totals are obtained :

Totals at present known for the production of cereals in the Northern Hemisphere.

Crops	1931	1930	1929	1928	1927	1926	1925
(million centals).							
Wheat (29 countries) .	1,621	1,720	1,584	1,790	1,662	1,579	1,539
Rye (21 countries) . .	418	517	516	500	456	421	517
Barley (27 countries) .	505	626	631	637	531	496	517
Oats (23 countries) (1) .	867	956	948	1,036	909	924	980
(million bushels).							
Wheat (29 countries) .	2,702	2,867	2,639	2,933	2,770	2,631	2,564
Rye (21 countries) . .	746	923	922	893	814	752	923
Barley (27 countries) .	1,053	1,303	1,314	1,326	1,105	1,033	1,076
Oats (23 countries) (1) .	2,710	2,989	2,962	3,237	2,840	2,887	3,064

(1) Including Syria and Lebanon.

On the basis of these data and the general information on the prospects of crops in the countries for which estimates are still lacking, the total production of the northern hemisphere (excluding the U. S. S. R. and China) may be approximately estimated for wheat at about 1,830 million centals (3,050 million bushels), showing a reduction of 85 million centals (145 million bushels) compared with last year and of 30 (50) in comparison with the preceding quinquennium; for rye at about 455 million centals (810 million bushels), showing reduction of 100 (180) and 65 (120) respectively; for barley, at about 615 million centals (1,285 million bushels), showing reductions of 120 (255) and 70 (145); for oats, at 1,065 million centals (3,330 million bushels), showing reductions of 80 (250) and 90 (280).

The decidedly unfavourable results of the year may be attributed principally to the adverse weather conditions which prevailed in North America; but in various European countries, cereal crops also suffered, due partly to intense drought and excessive heat at the critical stage of growth (in Czechoslovakia, Austria, Hungary and in different regions of Rumania, Poland, Italy and Spain) and partly to excessive rains (in France, Germany, Great Britain and the Baltic countries).

For the U. S. S. R., there is a lack of precise data but information on the course of the weather gives reason to believe that production of cereals will probably be smaller than last year, despite the increase in area.

In China, damage by floods has considerably reduced the forecasts of wheat production.

Lastly, with regard to the countries of the southern hemisphere, news on weather conditions and the condition of crop is very favourable in both Australia and Argentina; in both countries, however, areas sown to wheat are reported to be have been considerably reduced.

Summarising, all the information available leads to the conviction that world production of cereals this year will show a fairly considerable reduction compared last year and that the large stocks of the old wheat crop which are now weighing on the market, may therefore be lightened during the commercial season 1931-32.

* * *

Germany : The very wet weather of August greatly interrupted harvesting. The prolonged drought has had a great effect on quantity and quality and has been especially prejudicial to spring cereals.

Production of spelt (including that mixed with wheat and with rye) has risen to 3,049,000 centals against 3,048,000 in 1930 and 3,238,000, the average for 1926-29. Percentages 100.0 and 94.2.

Area under buckwheat this year is 30,100 acres against 30,800 in 1930 and 46,000 on the average of 1927-29. Percentages 97.7 and 65.5.

Area under mixed grain this year is 895,000 acres against 886,000 in 1930 (101.0 %) and 895,000, average 1927-29 (100.0 %).

Austria : The first days of August were rather sunny and warm. Storms, accompanied by hail were sporadically reported. At the beginning of the second decade of August the rains were more widely spread, and were accompanied by fall in temperature. Early in the second half of the month exceptionally copious rains fell and, in some of the higher regions, snowstorms. The abnormally cold and rainy weather was prolonged up to the end of August.

In the lowlands, for the most part, cereals were harvested in a satisfactory condition while in hilly regions and in higher areas the harvest was hindered by rains. On the uplands the winter wheat crop was damaged by excessive humidity. Yield of straw is very poor. Grain of rye and winter barley is generally satisfactory. Spring cereals have suffered greatly from excessive humidity in the harvest period.

Belgium : August was unfavourable, owing to low temperatures and rain, which delayed and rendered difficult harvesting and other seasonal operations. Only at the end of the month were there a few sunny days.

The greater part of the winter-barley and of the rye has been brought in under satisfactory conditions, at least in Middle and Lower Belgium, but the wheat and oats harvest had to be effected under deplorable conditions in the drier intervals and much grain has germinated in the fields.

Bulgaria : The early part of August was characterised by very hot weather throughout the country, the temperature reaching the maximum (104°F. in the shade), on 10 August. There was also some rain in this period. In the last two decades of the month it was not so hot but still dry, and work in the fields was unfavourably affected. In the first days of September abundant rains fell almost throughout the country and allowed autumn work to be taken up again. Threshing is almost finished and continues only in highland areas.

Estonia : According to the estimates of agricultural correspondents, crop condition on August 15 was satisfactory. Winter cereals promise yields a little below the normal whereas spring cereals may slightly exceed it.

Irish Free State : The second and third weeks of August were rainy with flooding in some districts, the opening and concluding portions of the month fine. Winter-sown wheat has given satisfactory crops but later sowings are less satisfactory. Oats in lea ground is quite good in yield and quality, though the heavier crops have been tossed by storms and rain. On manured land and in cold and wet ground oats has not done so well. Barley is generally an average crop. Insect pests have caused no trouble. Rust in oats has been reported as prevalent in portions of County Cork.

Cereals.

COUNTRIES	(†) AREA					(†) PRODUCTION							
	1931	1930	Average 1925 to 1929	% 1931/32	1931	1930	Average 1925 to 1929	1931	1930	Average 1925 to 1929	% 1931/32	1931	
	—	—	—	—	—	—	—	—	—	—	—	—	
	1931/32	1930/31	1925/26 to 1929/30	1930/1931	1931/32	1930/31	1925/26 to 1929/30	1931/32	1930/31	1925/26 to 1929/30	1930/1931	Aver.	
	1,000 acres			= 100	1,000 centals			1,000 bushels				= 100	
WHEAT													
Germany	5,355	4,402	4,067	121.7	131.6	94,014	83,531	71,859	156,687	139,216	119,763	112.5	130.8
Austria	508	508	504	100.0	100.8	5,904	7,205	6,786	9,840	12,008	11,309	81.9	87.0
Belgium	396	411	375	96.3	103.5	9,153	7,942	8,879	13,253	13,236	14,790	115.3	103.1
Bulgaria	2,869	3,006	2,662	95.5	107.8	34,238	34,301	24,265	57,062	57,317	40,474	99.6	141.0
Spain	10,372	11,134	10,704	97.7	101.6	78,467	88,021	87,709	130,775	146,699	146,179	99.1	89.5
Finland	47	51	43	92.7	110.0	708	726	801	1,181	1,210	1,002	97.6	117.8
*France	12,404	13,990	13,128	96.2	95.2	—	138,673	174,815	—	231,118	291,353	—	—
*Engl. and Wales	1,197	1,346	1,491	88.9	80.8	21,862	23,672	29,677	36,437	39,954	49,460	91.2	73.7
*Scotland	51	54	56	94.6	91.8	—	1,277	1,322	—	2,128	2,203	—	—
Hungary	4,133	4,187	3,821	98.7	108.2	37,000	50,604	47,726	61,686	84,838	79,542	73.1	77.5
Italy	12,063	11,896	12,156	101.4	99.2	148,288	126,492	137,624	247,141	210,815	229,205	117.2	107.8
*Lithuania	425	526	352	94.2	140.9	—	6,796	8,647	—	11,827	6,078	—	—
Luxemburg	25	25	30	100.0	83.8	—	250	265	—	416	573	94.1	72.6
Malta	10	9	9	104.8	105.8	—	166	182	—	277	303	292	91.6
Netherlands	191	142	135	184.4	141.1	4,561	3,634	3,623	8,102	6,056	6,037	133.8	184.2
Poland	4,012	4,066	3,804	98.7	121.4	43,652	49,394	36,305	72,751	82,321	60,508	88.4	120.2
Rumania	7,029	7,551	7,748	93.1	90.7	67,453	78,464	63,319	112,419	130,770	105,580	86.0	106.5
Sweden	684	646	488	105.9	140.2	11,773	12,882	9,831	19,621	21,469	15,635	91.4	125.5
Switzerland (1)	179	180	171	99.6	104.6	3,565	3,461	3,357	5,941	5,769	5,595	103.0	106.2
Czechoslovakia	1,978	1,975	1,869	100.2	105.9	22,991	30,384	28,686	38,317	50,606	47,899	75.7	80.1
Yugoslavia	5,390	5,365	4,708	100.5	114.5	50,848	48,197	48,593	84,746	80,326	80,886	105.5	104.6
Total Europe	56,938	56,900	54,283	100.1	104.9	655,193	649,727	608,829	1,058,624	1,082,855	1,014,690	97.8	104.3
*U. S. S. R.	92,369	83,795	71,278	110.2	120.6	—	650,366	477,453	—	1,083,921	795,739	—	—
Canada	24,100	24,898	23,104	96.8	104.4	162,840	238,723	258,428	271,400	397,872	430,704	68.2	63.0
United States (2)	40,602	39,514	36,467	103.0	111.6	465,108	367,200	323,463	775,180	612,000	547,427	126.7	141.6
Mexico	16,977	21,008	20,984	80.8	80.9	66,600	150,600	164,816	111,000	251,000	274,687	44.2	40.4
Total Nord Amer.	1,424	1,216	1,261	117.1	113.0	9,467	6,868	6,456	15,778	11,446	10,760	137.8	146.6
*Korea	—	848	890	—	—	5,370	5,391	5,605	8,951	8,985	9,342	99.6	95.8
India	32,181	31,854	31,475	101.7	102.2	208,365	294,506	191,654	347,275	390,843	319,424	88.9	103.7
Japan	1,231	1,193	1,174	102.7	104.9	17,714	17,723	17,817	29,522	29,538	29,695	99.9	99.4
Syria and Lebanon	1,168	1,175	1,147	99.4	101.8	8,496	11,132	7,435	14,158	16,553	12,392	73.3	114.3
Total Asia	34,380	34,027	33,796	101.6	102.3	234,574	263,361	216,906	390,955	438,934	361,511	89.1	108.1
Algeria	3,535	3,980	3,654	88.8	96.8	13,228	19,350	17,760	22,046	32,249	29,849	68.4	74.4
*Cyrenaica	18	38	33	46.2	53.2	—	93	110	—	155	198	—	—
*Eritrea	22	—	27	—	82.4	110	—	61	—	184	101	—	161.8
*Kenya (2)	58	71	57	82.4	102.7	—	389	358	—	648	697	—	—
French Morocco	2,732	2,957	2,632	92.4	103.8	20,825	12,782	16,553	34,708	21,302	27,688	162.0	125.8
*Tripolitania	17	12	—	140.0	—	46	11 (3)	60	77	18 (3)	115	420.0	67.2
Tunis	1,903	1,923	1,719	99.0	110.7	8,157	6,239	7,063	13,595	10,398	11,780	130.7	115.4
Total Africa	8,170	8,860	8,005	92.2	102.0	42,210	38,371	41,471	70,349	63,949	69,017	110.0	101.9
*Argentina	17,051	21,283	20,484	80.1	83.2	—	143,301	145,810	—	238,830	242,026	—	—
*Chile	1,426	1,610	1,602	88.6	89.0	—	12,714	17,255	—	21,190	28,758	—	—
Grand Totals	182,890	186,421	177,990	98.1	102.8	1,615,992	1,714,850	1,625,309	2,693,296	2,858,656	2,768,796	94.2	96.4

COUNTRIES	(f) AREA					(g) PRODUCTION							
	1931	1930	Average 1925 to 1929	% 1931 1931/32		1931	1930	Average 1925 to 1929	1931	1930	Average 1925 to 1929	% 1931 1931/32	
	—	—	—	1930	Aver.	—	—	—	—	—	—	1930	Aver.
	1931/32	1930/31	1925/26 to 1929/30	1930/ 1931 = 100	1931/ 1930 = 100	1931/32	1930/31	1925/26 to 1929/30	1931/32	1930/31	1925/26 to 1929/30	1930/ 1931 = 100	1931/ 1930 = 100
	1,000 acres					1,000 centals			1,000 bushels				
Hungary	1,530	1,611	1,649	95.0	92.8	11,601	15,907	16,836	20,716	28,406	30,084	72.9	68.9
Italy	296	302	307	98.3	96.5	3,609	3,431	3,649	6,446	6,127	6,516	105.2	98.9
*Latvia	—	680	627	—	—	3,611	8,051	5,228	6,449	14,377	9,335	44.9	69.1
*Lithuania	1,210	1,197	1,192	101.1	101.4	—	14,099	11,412	—	25,177	20,379	—	—
Luxemburg	22	22	17	99.4	129.9	—	212	209	—	378	430	307	78.8
Netherlands	444	475	439	93.8	90.8	7,097	8,340	8,806	12,673	14,892	15,882	85.1	80.0
Poland	13,812	14,567	14,016	91.4	95.0	113,759	153,399	136,375	203,141	278,928	243,534	74.2	83.4
Rumania	938	968	720	97.0	130.4	8,472	10,241	5,971	15,129	18,288	10,662	82.7	141.9
Sweden	510	595	741	85.6	68.8	6,834	10,083	10,981	12,204	18,005	19,009	67.8	62.2
Switzerland	46	49	49	92.5	93.5	—	800	831	—	1,429	1,484	1,623	96.3
Czechoslovakia	2,493	2,599	2,535	95.9	98.4	23,279	39,409	37,015	50,498	70,374	60,099	71.8	76.4
Yugoslavia	623	620	531	99.6	117.4	4,548	4,382	4,148	8,121	7,825	7,407	103.8	109.6
Total Europe	35,549	38,088	37,310	93.4	95.3	339,515	469,532	443,683	695,565	838,545	792,293	82.9	87.8
*U. S. S. R.	70,086	27,233	66,620	97.0	105.2	—	—	480,038	—	—	873,285	—	—
Canada	983	1,443	794	67.9	123.8	4,243	12,330	7,245	7,576	22,018	12,937	84.4	53.6
United States	3,294	3,525	3,601	93.4	91.5	20,272	26,968	25,832	36,200	43,149	40,129	75.2	78.5
Total North Amer.	4,277	4,973	4,395	86.0	97.4	24,515	39,293	33,077	43,776	70,167	59,066	63.4	74.1
*Argentina	1,253	1,322	901	94.8	139.0	—	2,646	3,352	—	4,724	5,986	—	—
*Chile	7	8	7	88.7	95.2	—	67	66	—	120	118	—	—
Grand Totals	39,836	43,061	41,705	92.5	95.5	414,030	508,875	476,760	739,341	908,712	851,359	81.4	86.8

BARLEY

Germany	4,001	3,753	3,692	106.6	108.4	66,181	63,058	63,172	137,879	131,373	131,611	105.0	104.8
Austria	430	430	371	100.0	116.0	5,068	5,893	5,237	10,559	12,273	10,911	86.0	96.8
Belgium	70	84	77	83.2	91.3	1,630	1,836	1,394	3,396	3,325	3,947	88.8	86.1
Bulgaria	652	692	562	94.2	116.1	8,739	9,537	5,853	13,207	19,969	12,304	91.0	149.2
Spain	4,465	4,543	4,456	98.3	100.2	43,281	49,883	44,786	90,129	108,926	93,305	86.7	96.6
*Irish Free State	115	116	131	99.0	87.9	—	2,648	3,001	—	5,517	6,253	—	—
Finland	276	272	271	101.4	101.7	3,238	2,987	3,086	6,788	6,223	6,429	109.1	105.6
*France	1,955	1,799	1,739	108.6	112.4	—	21,761	24,356	—	45,336	50,742	—	—
Engl. and Wales	1,029	1,020	1,164	100.9	98.4	17,270	16,503	21,524	35,980	34,382	44,843	104.6	85.2
*Scotland	92	107	121	88.3	76.0	—	2,128	2,433	—	4,433	5,068	—	—
Hungary	1,136	1,131	1,054	104.8	112.5	9,207	12,250	13,118	19,181	27,605	27,330	69.5	70.2
Italy	540	533	577	92.5	93.5	5,525	5,377	5,416	11,511	11,292	11,285	102.8	102.0
*Lithuania	465	529	494	88.0	94.1	—	5,224	4,831	—	10,884	10,085	—	—
Luxemburg	9	7	8	116.1	101.9	—	92	99	—	192	206	233	93.1
Malta (4)	7	7	6	101.4	106.0	—	137	142	—	138	285	288	96.8
Netherlands	70	76	71	92.8	99.3	1,832	1,939	1,910	3,817	4,040	3,302	94.5	93.8
Poland	3,111	3,043	2,841	102.1	109.5	32,629	32,274	30,767	67,977	67,238	64,099	101.1	104.1
Rumania	4,424	4,381	4,360	90.6	101.5	37,611	52,279	36,233	78,358	108,916	75,487	71.0	108.5
Sweden	313	328	348	96.0	90.0	—	5,005	5,290	—	10,426	11,021	11,016	94.6
Switzerland	18	16	16	109.2	110.1	—	295	238	—	615	496	536	124.1
Czechoslovakia	1,759	1,673	1,766	105.1	99.6	21,613	26,543	28,597	45,446	55,934	50,579	81.2	76.8
Yugoslavia	1,105	1,133	976	97.6	113.3	8,184	8,915	8,342	17,051	18,574	17,379	91.8	98.1
Total Europe	23,465	23,675	22,616	99.1	103.6	267,737	296,345	276,182	557,797	617,403	575,394	90.3	96.9
*U. S. S. R.	17,070	13,417	17,724	92.7	96.3	—	—	124,687	—	—	209,770	—	—
Canada	4,075	5,559	4,297	73.3	94.8	34,808	64,877	50,183	72,516	135,160	104,550	53.7	69.4
United States	12,771	12,901	10,222	99.0	124.9	101,760	160,786	127,201	212,000	334,971	205,006	63.3	80.0
Total North Amer.	16,846	18,460	14,519	91.3	116.0	136,568	225,663	177,384	284,516	470,131	309,556	60.5	77.0
*Korea	—	2,332	2,209	—	—	19,621	19,127	17,966	40,877	39,849	38,805	102.8	111.1
Japan	2,105	2,110	2,336	99.8	90.1	35,040	34,780	40,896	73,001	72,472	84,783	100.7	86.1
Syria and Lebanon	941	840	706	112.0	133.4	5,901	10,523	6,746	12,294	21,924	14,055	58.1	87.5
Total Asia	3,046	2,980	3,042	103.3	100.2	40,941	45,309	47,442	85,295	94,395	98,840	90.4	89.3

COUNTRIES	(f) AREA					(f) PRODUCTION							
	1931	1930	Average 1925 to 1929	1931/32		1931	1930	Average 1925 to 1929	1931	1930	Average 1925 to 1929	1931/32	
	—	—	—	1930	Aver.	—	—	—	—	—	—	1930	Aver.
	1931/32	1930/31	1925/26 to 1929/30	1930/1931	= 100	1931/32	1930/31	1925/26 to 1929/30	1931/32	1930/31	1925/26 to 1929/30	1930/1931	= 100
	1,000 acres					1,000 centals			1,000 bushels				
Algeria	3,199	3,650	3,445	87.6	92.8	11,244	18,327	16,661	23,425	38,183	34,712	61.3	67.5
*Cyrenaica	82	127	139	64.5	61.3	...	276	772	...	574	1,609	...	...
*Entrea	82	—	58	—	105.9	820	—	166	666	—	846	—	192.8
French Morocco	3,156	3,207	3,028	98.4	104.2	24,643	17,965	21,933	51,341	37,491	45,095	138.9	112.4
*Tripolitania	371	247	—	150.0	—	551	166	(4)	1,148	844 (4)	1,338	833.8	55.8
Tunis	1,087	1,202	1,243	90.4	87.5	3,968	2,046	4,195	8,268	5,512	8,741	150.0	94.6
Total Africa	7,442	8,059	7,716	92.3	96.4	39,853	38,968	42,789	83,084	81,186	89,148	102.3	93.1
*Argentina	1,490	1,422	1,171	104.8	127.2	...	6,334	7,961	...	14,238	16,587	...	...
*Chili	144	166	173	86.9	83.4	...	1,860	2,681	...	3,876	5,585	...	...
Grand Totals	50,799	53,144	47,893	95.6	106.0	483,101	606,288	543,797	1,010,642	1,363,116	1,132,932	86.0	89.2
OATS													
Germany	8,309	8,499	8,640	97.8	96.2	141,035	124,702	143,898	440,780	389,690	449,664	118.1	98.0
Austria	772	772	737	100.0	102.0	7,573	8,834	9,591	23,665	27,606	29,972	85.7	79.0
Belgium	728	674	678	107.9	107.3	12,986	12,231	15,318	40,581	38,223	47,869	106.2	84.8
Bulgaria	326	345	338	94.5	96.6	2,998	2,437	2,382	9,370	7,616	7,287	123.0	128.6
Spain	1,693	1,940	1,873	87.3	90.4	13,562	15,999	12,913	42,880	49,995	40,354	84.8	106.0
*Irish Free State	628	644	656	97.5	95.8	...	14,180	14,419	...	44,250	45,060	...	...
Finland	1,149	1,137	1,110	101.1	103.5	14,429	13,207	12,933	45,091	41,458	40,415	108.8	111.6
*France	8,832	8,583	8,623	100.6	100.1	...	96,880	111,902	...	302,749	349,660	...	...
Engl. and Wales	1,652	1,778	1,820	92.9	90.8	28,090	30,036	32,202	87,780	93,863	100,632	93.5	87.2
*Scotland	846	862	906	98.2	93.4	...	14,498	15,882	...	45,290	40,630	...	...
Hungary	612	608	687	100.7	89.1	3,302	5,760	3,295	10,317	17,999	25,784	57.3	40.1
Italy	1,233	1,282	1,243	97.7	99.2	13,947	11,783	13,793	43,584	36,821	43,103	...	...
*Lithuania	851	855	828	99.5	102.7	...	8,599	6,846	...	26,871	21,394	...	...
Luxemburg	70	70	72	100.0	97.6	880	880	971	2,749	2,750	3,085	100.0	90.6
Netherlands	366	370	377	99.0	97.1	6,905	6,645	7,332	21,578	20,454	22,913	105.5	94.2
Poland	5,465	5,404	5,007	101.1	109.1	54,234	51,756	51,251	169,480	181,733	160,159	104.8	105.8
Rumania	2,230	2,686	2,806	83.0	79.5	19,363	25,497	22,518	60,510	79,670	70,368	75.9	88.0
Sweden	1,589	1,629	1,763	97.5	90.1	22,950	25,299	26,111	71,719	79,058	81,595	90.7	89.0
Switzerland	45	48	50	93.9	90.6	851	851	928	2,659	2,659	2,900	100.0	91.7
Czechoslovakia	2,116	2,049	2,073	103.8	101.9	26,526	28,833	30,997	82,893	90,101	96,865	92.0	85.6
Yugoslavia	979	1,037	936	94.4	104.6	6,111	6,253	7,543	19,008	19,634	23,586	97.3	81.0
Total Europe	29,334	30,308	30,235	96.8	97.0	375,742	370,993	398,866	1,174,184	1,169,344	1,240,451	101.3	94.2
*U. S. S. R.	42,497	44,267	41,262	96.0	103.0	...	...	326,462	...	...	1,020,185	...	...
Canada	13,650	13,259	12,831	103.0	106.4	115,389	143,870	133,308	360,591	449,595	416,583	80.2	86.6
United States	41,248	40,125	42,554	102.8	96.9	371,520	434,577	421,428	1,161,000	1,353,052	1,316,963	85.5	88.2
Total North Amer.	54,898	53,384	55,386	102.3	99.1	486,909	578,447	554,736	1,521,591	1,807,647	1,733,536	84.2	87.8
Syria and Lebanon	27	28	41	95.9	96.8	220	176	282	687	551	580	124.7	78.1
Algeria	542	638	605	84.9	89.6	2,601	5,300	4,118	8,130	16,561	12,869	49.1	63.2
French Morocco	73	103	71	71.6	103.9	755	754	559	2,359	2,867	1,747	100.1	136.0
Tunis	99	124	104	79.6	94.7	1,036	661	825	3,238	2,067	2,577	158.7	123.7
Total Africa	714	865	780	82.6	91.5	4,392	6,715	5,502	13,727	20,985	17,198	65.4	79.1
*Argentina	3,484	3,937	3,387	88.5	102.9	...	15,873	21,278	...	49,604	66,498	...	...
*Chili	156	193	193	81.0	80.9	...	1,635	2,199	...	5,109	6,870	...	...
Grand Totals	84,973	84,585	86,441	100.5	98.3	867,263	956,331	953,386	2,710,189	2,968,527	2,996,666	90.7	89.2

(f) The two dates mentioned refer to the years in which the harvest took place in the northern and southern hemispheres respectively.
 * Countries not included in the totals. — (s) Autumn crops. — (f) Spring crops. — (r) Including spelt and meslin. — (a) European crops only. — (3) Average 1925 to 1928. — (4) Barley and meslin.

France : The period from 15 August to 15 September was characterised by a continuation of bad weather, with almost constant rain, and often stormy ; only in September were there a few fine days permitting the crops to be brought in. These circumstances considerably hindered harvesting and threshing north of the Loire ; part of the crop was in the stooks during this period and was damaged. Yields are very irregular.

It is estimated in a general way that volume yield is average, but specific gravity is low. In the regions north of the Loire the latter fluctuates around 59 lb. per bushel, a decrease of 2-3 lb. on the average on the results of the first threshings. South of the Loire the specific gravity was probably in the neighbourhood of 60, save in the south, where it is 62. The mean specific gravity of the crop as a whole seems to be scarcely superior to 59 lb. per bushel. The total crop should therefore be hardly more than 154 million centals (257 million bushels) according to the most usual estimates. It must be remembered that the half of the crop north of the Loire is of rather indifferent quality ; one-fourth of the wheat has been brought in damp and almost one-tenth will be unfit for consumption.

The oat crop has also suffered from the bad weather to a fairly considerable extent ; it appears that the total crop will be below the average, despite the slight extension of spring sowings. The figure of 110 million centals (344 million bushels) that has been given appears on the whole to be rather higher than the actual amount. The crop being for the most part north of the Loire, quality leaves much to be desired.

The rye crop is also deficient, it is estimated at between 18 and 20 million centals (31 and 35 million bushels).

The barley and winter-barley crops are on the whole a good average as regards quantity, an approximate figure from a private source being 25.4 million centals (52.8 million bushels), corresponding to an average yield over a relatively large area. On the other hand quality is bad and will make a significant portion of the production unfit for malting.

The buckwheat harvest has begun and appears to be disappointing, due to the bad weather at the periods of flowering and ripening.

Preparation of the land for winter sowings has been rendered difficult in the south by the drought and to the north of the Loire, by the wetness of the soil.

Great Britain and Northern Ireland : In England and Wales and Scotland the weather during the first three weeks of August continued to be very wet and stormy, with cold winds and temperatures below normal for the time of year ; though the last week of the month was fine and crops showed some improvement, work in the fields was still behindhand and the crops were in need of further warmth and sunshine. Heavy rains caused much laying and made harvesting difficult. In Northern Ireland, on the other hand, weather in August was much better and at the beginning of the month temperatures rose to the maximum for the year ; the fine weather was interrupted only by a few days of heavy rainfall in the middle of the month. In the south of England wheat cutting was well in hand but in the north only a small proportion had been cut by the end of the month, while in Scotland it was not expected that harvesting would begin before the second week of September ; in Northern Ireland cutting began in early districts.

Over England and Wales the yield of wheat is forecasted at about 16 $\frac{1}{4}$ cwt. per acre, which is $\frac{1}{4}$ cwt. above that of 1930 and $1\frac{1}{2}$ cwt. below the ten-year average ; yields in Scotland vary considerably ; in Northern Ireland they will be below average.

Cutting of barley made slow progress in England and Wales and began in a few early districts of Scotland.

In England and Wales yield is expected to be about 15 cwt. per acre, $1\frac{1}{2}$ cwt. more than last year but $1\frac{1}{2}$ cwt. below the ten-year average. Oats have ripened irregularly

in England and Wales and in some districts are not as good as was expected, the average yield being forecasted at about 15 cwt. per acre, about equal to that of 1930 and 1/4 cwt. above the ten-year average, cutting in Scotland had begun only in the southwest; on the whole, the yield is expected to be average or above average, in Northern Ireland cutting began in early districts.

The following are the areas under mixed grain in Great Britain.

	1931	1930	Average 1925-29	% 1931	
	—	—	—	1930 = 100	1925-29 = 100
	(thousand acres)				
England and Wales	122.3	130.0	120.4	94	102
Scotland	1.4	1.1	1.4	132	103

Hungary: In the three weeks from 5 August to 26 August, the weather was characterised by variable and rather low temperatures for the season and frequent rains. The territorial distribution of rainfall was almost uniform over the whole of the country.

Threshing of cereals has been nearly finished everywhere. The specific weights of cereals for the season now nearly terminated, compared with the corresponding data of the four preceding seasons, are given in the following table:

Specific Weights.

	lbs per bushel			
	Wheat	Rye	Barley	Oats
1931	62.55	56.58	50.41	33.79
1930	62.47	56.53	50.86	33.61
1929	63.02	57.73	52.28	36.08
1928	63.89	57.89	53.41	37.48
1927	63.68	57.40	52.59	37.65

Italy: In August the weather continued to be prevalently dry, save in some southern and central provinces where precipitation was more or less abundant. Preparations for the next sowings are in progress. The last threshings confirm expectations of a high unit yield of wheat.

Latvia: The mean temperature of August has been only a little above normal; precipitation has in general fairly closely approached the normal throughout the month. In the first ten days it was very hot, but subsequently temperatures were generally below normal.

Crop condition of spring wheat on 15 August was excellent according to 6.79 % of correspondents' replies, good according to 48.95 %, average according to 38.02 %, below average according to 5.07 % and bad according to 1.17 %. The corresponding figures for barley are: 5.75 %, 52.58 %, 36.07 %, 4.51 % and 1.09 % and for oats 8.75 %, 57.39 %, 30.96 %, 2.62 % and 0.58 %.

Estimation of yields gives 10.7 centals (17.9 bushels) per acre for summer wheat, 10.4 (21.6) for barley and 10.1 (31.6) for oats.

Lithuania: Weather in August was unfavourable to growth and harvesting.

Luxemburg : Rains and storms in August and lack of sun caused considerable damage to all crops. The wheat harvest has been made partly under bad conditions and quality has suffered severely. Oats, which is almost all still in the fields has been much affected by weeds.

Poland Harvesting has been effected under favourable conditions.

Rumania : In the latter half of August general and plentiful rains were recorded. Weather in general favoured the crops remaining in the fields

Czechoslovakia · The dry warm weather of July continued at the beginning of August but soon afterwards, it was interrupted by brief rains which later became constant and were accompanied by a quite considerable fall in temperature. In places, precipitation was so abundant that it not only delayed harvesting, but greatly prejudiced the quality of the grain and straw.

Production of mixed cereals in the current year has been 289,000 centals (499,000 bushels) against 335,000 (578,000) in 1930 and 334,000 (576,000), the 1925-29 average Percentages 86·3 and 86·6.

Yugoslavia : In the first ten days of August weather was prevalently dry and hot. In the last ten days a sharp fall in temperature took place with local rains, even accompanied by snow in Slovenia. At the beginning of September, however, there was a return of hot dry weather.

U. S. S. R. : During August and the beginning of September rains fell rather frequently but were relatively scarce in northwestern areas and northeastern areas, in the Ukraine, in the North Caucasus and in Siberia, light scattered showers fell in central-eastern and southeastern areas of the European part of the Union.

On September 5, according to the data of the Commissariat for Agriculture, the harvesting of straw cereals had already been effected on 184,067,000 acres or 85·6 % of the area sown. Except in the Transcaucasus and the northern areas of the European region, Siberia and Kasakstan, harvesting had been completed in the remaining territories of the Union.

Cereals had been threshed from a harvested area of 73,189,000 acres. In many areas, but especially in the Ukraine, in the regions of the Middle and Lower Volga, in the central black earth regions and in the North Caucasus, on September 5 there still remained in the fields considerable quantities of cereals which had been cut but not stacked, covering about 27 million acres. In some zones there were reports of damage to these cereals by rain.

With respect to the winter sowings for the agricultural year 1931-32, according to the Government plan, the area to be sown in the autumn of this year is about 106 million acres. The wheat area should be increased to 37 million acres, that is, by about 26 % compared with that of last year and by 75 % compared with the average of the preceding five years; for rye, the area should be 67,708,000 or about 2 % smaller than that of last year but 4 % larger than that of the preceding five years.

According to the Government plan, the wheat area sown with selected seed should, this autumn, reach about 28 $\frac{1}{2}$ million acres against 17 millions last autumn.

Up to September 5, winter sowings had been effected on an area of 35,510,000 acres, or about $\frac{1}{3}$ of the area forecasted in the plan.

Argentina (Telegram of 17 September) : Crop condition of wheat and of all other cereals is good. Weather is generally favourable.

Canada : Though some delay was caused by the rains at the end of August, the weather in the earlier part of September favoured harvesting in the West. By 10 September threshing was well advanced in Manitoba and under way in Saskatchewan and Alberta. Considerable acreage is being left for feed in Southern Saskatchewan and Alberta. In North Alberta the crop is reported to be heavy. Late crops were brought on by the rains at the end of August ; no harmful frosts had been experienced up to 10 September and the crops were maturing well. Marketings were so far light as compared with those of last year to the corresponding date. In the East, harvesting was practically completed. Threshing results were reported good.

United States : In the Middle West work on the land for winter cereals was in full swing in mid-September, though rain was wanted in some parts. East of the Mississippi sowings have gone forward fairly well. If farmers carry out the intentions to plant as reported early in August seedings this autumn will be 12 % below those of last year. These reports indicated that the intention to sow were 37,344,000 acres, the smallest since these reports were first made in 1923. Even if this year's intentions were carried out to the full the acreage sown would be the smallest in any autumn since 1914. During the past eight years actual seedings have averaged about 3 % below August intentions. There are considerable areas in the western half of the country where the acreage sown is dependent on more liberal rainfall before planting time. Decreases are reported as intended in most of the important winter wheat States, the chief exceptions being States where spring wheat gave a low yield this season and considerable numbers of farmers desire to shift to winter wheat if weather conditions permit.

Intentions to plant rye are 5.5 % lower than last autumn, or 3,490,000 acres compared with the 3,692,000 acres actually sown for grain last autumn. Excepting Wisconsin and Nebraska, most leading rye States are planning a decrease. Most States in the Cotton Belt indicate intentions to increase, due to the diversification in progress. In various other States increases are planned because present soil conditions are not favourable for wheat or because there is a possibility that the crop may be needed for hay or pasturage.

China : The Bureau of Statistics of the National Government has initiated a service of forecasts of Chinese agricultural crops. These forecasts are based on reports received from 2,000 agricultural farms scattered over the most important agricultural regions of the country. Previously it had not been possible to publish forecasts in time due to delayed receipt or entire lack of such reports. This year, however, the Bureau of Statistics received before June 20, reports from 160 districts of 12 provinces which are the most important producing centres of wheat. On the basis of the reports the following table has been prepared.

First forecast of wheat production in China in 1931.

	Average annual production		Production in 1931		% 1931 (Average = 100)
	ooo centals	ooo bushels	ooo centals	ooo bushels	
Spring wheat . . .	58,923	98,203	86,099	143,496	146
Winter wheat . . .	320,761	534,590	276,590	460,974	86
<i>Total</i> . . .	<i>379,684</i>	<i>632,793</i>	<i>362,689</i>	<i>604,470</i>	<i>93</i>

The increase in production of spring wheat, which is produced almost entirely in Manchuria, is to be attributed to the increase in the area sown. In the winter cereal

area, the province of Shansi is the least fortunate. The wheat area is below the normal as a consequence of bad weather during the sowing period. The situation is better in Shantung, North Kiangsu and Honan, where however, the area is below the normal due to the civil war and unfavourable weather in the sowing period.

It should be noted that these estimates were made before the occurrence of the floods which have considerably damaged the crops.

Palestine : Threshing of wheat is almost completed and that of barley was already over at the beginning of August. Yields appear on the whole normal.

Algeria : Threshing has been completed and it appears that the losses caused by the scirocco and by the heat are less than was previously estimated ; at the beginning of August a general reduction of 25 % with respect to the estimates at the end of June was officially given and the figures inserted in the table for cereal production were calculated on this basis. In the absence of official data and on the basis of private estimates it may, in fact, be assumed that production will be in the vicinity of 15 million centals (26 million bushels) for hard and soft wheat, 13 million centals (28 million bushels) for barley, and 2 to 2.9 million centals (6.9 to 9 million bushels) for oats

According to the same source, the heat has not too greatly affected the quality of the grain which remains satisfactory with specific gravity in some instances fairly high

A telegram of 19 August indicates that the reduction to be applied to the estimates of production made in June should be 22 % instead of 25 %, which raises the figures published in the table by several hundred thousand centals (bushels).

Eritrea : In the Huhai, Seræ and Hamasien districts large areas of wheat and barley were damaged by locusts during the first ten days of August.

Kenya : Owing to the rather considerable reduction in area sown to wheat, to locust damage and, in a few isolated cases, to rust, a very high yield is not to be expected and at the most an average one.

French Morocco : The crop is good in general, save in the regions of Taza and Oudjd and the after-harvest estimate differs little from that made during harvesting and threshing. Quality is good ; specific gravity of wheat is satisfactory at Fez, which is one of the chief centres of production, being 70 lbs. per bushel for hard wheat and 68 for soft wheat.

Tunis : Threshing is largely terminated. The after-harvest estimate has caused little or no change to estimates made in the course of the harvest and threshing, and a reduction of only 220,000 centals (367,000 bushels) for hard wheat

Union of South Africa : The serious drought of June was broken in the first half of July by very heavy and general rains and snowstorms. With the exception of a few areas, particularly Bechuanaland, Western Transvaal and Zululand, precipitation was unprecedentedly heavy for the time of year, especially in the border districts of Cape Province and in the Transkei. The snowfalls in the mountainous areas south of Basutoland were exceptional and snow lay in many areas over six feet deep. As a result of these conditions unusually frosty weather was experienced along the Cape South Coast. On the whole, however farming in the Union has been materially benefitted by these rains. For the winter cereal crops nothing better could have been desired and prospects for a bumper harvest were very bright, provided that there was an absence of rust and late frost. In the Cape Province the wheat crop was expected to be a good average especially along the river banks. In the Orange Free State the wheat producing districts bordering Basutoland were specially favoured ; the crop is very promising and planting continued

even into July. In the Transvaal, also, considerable sowings were made after the rains; prospects are promising but rust has appeared and there is danger from late frosts in August and September.

Australia: In three of the four leading producing States of the Commonwealth (New South Wales, South Australia and Western Australia), which last year accounted for about three-fourths of the total Australian wheat area, there has been sown to wheat this year about 10,225,000 acres against 13,198,000 in 1930, a reduction of 22 %. The reduction has been most marked in New South Wales, where it has been 36 %, in Western Australia it has been 22 % and in South Australia only 5 %.

Taking into account previous information, on the basis of which a reduction in area of about 30 % was also expected in Victoria, it may be estimated that the total area under wheat in Australia this year is about 13,600,000 acres against 18,100,000 last year.

The weather is generally very favourable to the crops. They have improved with respect to last month and have now an encouraging appearance in New South Wales, while in Victoria and Western Australia their condition is good and in South Australia excellent.

MAIZE

The first estimates of production in Rumania and Yugoslavia permit the statement that the crop of the two principal maize producers of eastern Europe will this year be rather abundant, although smaller than the record crop of 1929. Rainfall towards the end of August was very beneficial to the crops in these two countries, particularly in Yugoslavia and also in Bulgaria and Hungary; production in the latter country,

Maize.

COUNTRIES	AREA				CROP CONDITION (†)									
	1931	1930	Average 1925 to 1929	% 1931										
				1930 = 100	Aver. = 100	I-IX-1931			I-VIII-1931			I-IX-1930		
						Thousand acres								
						a)	b)	c)	a)	b)	c)	a)	b)	c)
Austria . . . . .	...	143	146	...	...	2.5	—	—	2.5	—	—	2.5	—	—
Bulgaria	1,705	1,689	1,671	101.0	102.0	120	—	—	120	—	—	140	—	—
Hungary	2,735	2,605	2,662	105.0	102.8	—	—	—	—	3.0	—	—	—	—
Italy	3,663	3,743	3,759	97.9	97.5	—	—	—	—	—	—	—	—	—
Rumania	11,486	10,939	10,806	105.0	108.3	—	—	—	—	—	—	—	—	—
Switzerland	3	3	3	79.2	76.4	—	—	—	—	—	99	—	—	—
Czechoslovakia	368	364	344	101.2	107.0	—	—	—	—	—	—	—	—	—
Yugoslavia	6,158	6,097	5,575	101.0	110.5	—	—	—	—	—	—	—	—	—
U. S. S. R.	9,742	9,682	8,886	100.6	166.2	—	—	—	—	—	—	—	—	—
Canada	164	161	174	101.9	94.1	101	—	—	—	—	—	—	—	85
United States	105,557	101,413	99,570	104.1	106.0	—	—	69.5	—	—	76.3	—	—	51.6
Syria and Lebanon	115	105	121	109.6	95.2	—	—	—	e)	—	—	—	—	—
Algeria	20	24	25	81.5	79.7	—	f)	—	—	f)	—	—	f)	—
Eritrea	22	—	13	—	166.7	—	—	—	—	—	—	—	—	—
Kenya (1)	204	206	201	98.9	101.7	—	—	—	—	—	—	—	—	—
French Morocco	837	649	561	129.0	149.3	—	—	—	—	—	—	—	—	—
Tunis (2)	44	37	45	119.0	99.2	—	f)	—	—	—	—	—	f)	—

a) above the average. — b) average. — c) below average. — d) very good. — e) good. — f) average. — g) bad. — h) very bad. — (†) See explanation of various systems on page 515. — (1) European crops only. — (2) Maize and sorgho.

although prejudiced by previous drought, is at present considered to be a little larger than that of last year, but still much below the average. The total crop of these four exporting countries is about 253 million centals (452 million bushels) against 224 (400) last year and as much for the average of the preceding quinquennium; the maximum was reached in 1929 with 290 million centals (520 million bushels).

On the contrary, the other European countries expect smaller crops than in 1930; a very large decrease is forecasted in Italy, where the maize crop has greatly suffered from drought, as also in Spain, Austria and Czechoslovakia, where yields will be below those of last year.

In the United States, the weather, which was rather dry in August, was not very favourable to the maize crop, so that the estimate made at the beginning of September is 34 million centals (60 million bushels) smaller than that of the preceding month. The production at present forecasted is considerably above the poor one of last year, but, although it is obtained from a larger area, it will not reach the average of 1925-29.

In Argentina, sowing has begun under favourable weather conditions.

Production of Maize.

COUNTRIES	ENGLISH MEASURES			AMERICAN MEASURES			% 1931	
	1931	1930	Average 1925 to 1929	1931	1930	Average 1925 to 1929	1930 = 100	Average = 100
	Thousand centals			Thousand bushels			%	%
Bulgaria	17,576	17,088	14,713	31,385	30,515	26,274	102.9	119.5
Spain.	13,119	16,152	13,144	23,428	28,844	23,471	81.2	99.8
Hungary	32,099	31,021	39,546	57,321	55,394	70,618	103.5	81.2
Rumania	132,273	99,648	99,979	236,211	177,942	178,534	132.7	132.3
Switzerland	66	64	84	118	114	150	103.4	78.5
Czechoslovakia	4,899	5,479	5,368	8,748	9,783	9,577	89.4	91.8
Yugoslavia	70,945	76,381	67,356	126,688	136,395	120,279	92.9	105.3
United States.	1,520,400	1,172,339	1,546,016	2,715,000	2,093,552	2,760,751	129.7	98.8
Syria and Lebanon	1,213	953	1,370	2,165	1,702	2,446	127.2	88.5
Algeria	127	164	144	226	292	257	77.4	88.3
Eritrea	159	—	79	283	—	142	—	200.0
French Morocco	2,080	3,354	2,973	3,715	5,990	5,309	62.0	70.0
Tunis (x)	110	132	108	197	233	192	88.3	102.5

(x) Maize and sorgho.

* * *

Austria: Though stems remain rather short, cobs are fairly numerous and well-developed. Ripening has been hindered by the cold and rainy weather. In the high-lands of Tirol and Carinthia the rains have been prejudicial to flowering, so that in some regions fecundation has been deficient.

Bulgaria: In August the weather was generally hot and dry, except for beneficial rains in the first ten days. The more plentiful rains in the first week of September greatly refreshed the crop, which was beginning to feel the effects of the prolonged drought. Its condition was very good at the beginning of September, when the harvest had already begun.

France : The rains in August very considerably improved the situation in the South-west, where the greater part of the crop is found. Results are satisfactory.

Hungary : Formation of the cobs of the grain is defective owing to the drought in July. The rains in August caused an improvement.

Italy : The crop, very promising at the beginning of the season with the abundant spring rains, will be an extremely small one owing to the persistent drought.

Rumania : At the end of August the crop had a good appearance save in two departments of the Old Kingdom and in the south of Bessarabia. Late sowings have benefited by the rains toward the end of August.

Czechoslovakia : The crop condition of maize, which has been favourably influenced by rainfall in August, is excellent.

Yugoslavia . The drought in August was prolonged until the third decade of the month and caused much anxiety for maize, especially for the late crop. However the situation was saved by the local rains at the end of the first decade. Further rains; though sparse, fell in the last decade of the month and considerably improved crop condition, and a good crop was expected.

According to the provisional estimate, production in the Canovin of the Danube (the leading area of the crop) is calculated at 35.3 million centals (63.0 million bushels) against 27.8 (49.6) million last year and yield per acre is 16 centals (28.4 bushels) against 13.4 (23.7).

Argentina : The new estimate of production of 208,653,000 centals (372,596,000 bushels) is larger by 864,000 centals (1,542,000 bushels) than that communicated by the Government of Argentina on April 25. The solution of the maize problem is still uncertain despite the greater interest displayed by the Government, which continues to carry out active propaganda among farmers to increase home consumption by devoting a larger quantity to the feeding of animals. The Minister of Agriculture has declared that the present level of prices does not necessitate the fixing of minimum prices which was suggested by some groups and which, in any case, could not exceed 4 pesos per quintal. He further regretted that the credit facilities accorded by the two official banks, to the extent of 3.60 pesos per quintal have been in poor demand by farmers.

(Telegram of 17 September) : Sowings were begun in favourable weather conditions

Canada : A good crop is reported

United States : Crop condition improved toward the end of August and early days of September, except in the west and north sections of the Corn Belt, where drought injury has been particularly severe. In the eastern and southern States the soil was in better and stronger condition to produce heavier yields this year, thanks to last year's drought, provided moisture supply continued ample. Ripening has been early owing to the hot weather.

Mexico : Sowing of "temporal" maize was effected under good conditions in all the leading producing zones. Crop condition is generally good.

China (Manchuria) : Area sown this year is 2,186,000 acres, as against 2,179,000 in 1930 and 2,332,000, the average of 1928 and 1929. Percentages: 100.4 and 93.7. Production is estimated at 34,560,000 centals (61,714,000 bushels) as against 34,958,000

(62,426,000) in 1930 and 37,217,000 (66,458,000), average 1927-1929. Percentages : 98.9 and 92.9.

Palestine Harvesting is in progress. Fair yields have been realised from dry cultivation. In the Huleh area the first (irrigated) crop has yielded well.

Egypt Weather in August was favourable to sowing, germination and growth of nili varieties. Water was sufficient after the middle of the month. Preparation of the land and sowing of late crops, and thinning, hoeing, fertilizing and irrigation of early crops are normal. Germination and development are satisfactory and crop condition on 1 September was 100 as on 1 August last and 1 September 1930.

Kenya Weather in July was variable with prevalence of drought especially in the earlier part of the month, but on the whole fairly favourable to crops, for which good results would have been obtained but for the serious losses caused throughout almost the whole country by locusts, as a result of which only a fair production is expected.

French Morocco : The crop is a bad one owing to the lack of spring rains.

Tunisia : The great summer heat, often accompanied by violent spells of scirocco, have been very prejudicial to maize and sorghum, the crop condition of which is, however, fairly good and the anticipated unit yield a little superior to the average of recent years.

RICE

Italy : Vegetation is good and the fields fairly promising.

United States : Production in 1931 is estimated at 18,180,000 centals (40,400,000 bushels), a decrease of 2.2 % on that of 1930 and of 1.2 % on the mean of 1925-29.

In California the crop is expected to be larger than last year, but is smaller in the three Southern States (Arkansas, Louisiana and Texas). The eastern part of the Louisiana Prairie District has suffered from deficiency of fresh irrigation water.

Mexico : Crop condition in the producing regions of the States of Michoacan and Morelos is good. In the States of Vera Cruz and Chiapas sowings are in progress and weather is favourable.

China (Manchuria) : The total area of paddy and upland rice sown this year is 502,000 acres, as against 465,000 in 1930 and 469,000, the average of 1928 and 1929. Percentages : 107.9 and 107.0. The total production is estimated at 7,440,000 centals (16,532,000 bushels) as against 6,883,000 (15,924,000) in 1930, and 6,482,000 (14,403,000) the average of 1927-1929. Percentages : 108.1 and 114.8.

India . In Bengal transplanting of winter seedlings was progressing in the earlier part of September, with moderate to heavy rain, though it was hindered in the flooded districts of eastern and northern Bengal.

In Assam it was reported at the end of August that more rain was needed for transplanting.

Egypt : August favoured development of summer rice (sefi) and water was adequate in the regions where the crop was authorized. Heading had begun in early crops. In the case of late crops transplanting and earthing-up was proceeded with. Crop condition of Sefi on 1 September was 100 against 99 on 1 September 1930.

POTATOES

The month of August brought a rather considerable change in the European crop situation. The bad weather afflicted the whole of northwestern Europe (Germany, Denmark, Belgium, Luxemburg, Switzerland, France, Great Britain and Ireland); the early varieties gave generally good yields but the quality of the main crop has been spoilt by rotting and mildew and its yields will probably be also diminished; but while in Belgium, Great Britain and Ireland a net deficit is anticipated, it seems that in the other countries indicated, production this year should again be above the average; the crop is expected to be below that of last year in Germany where it was exceptionally large but much larger in France, Switzerland and Luxemburg where the previous crop was bad.

In eastern and northeastern Europe (Austria, Hungary, Rumania, Czechoslovakia, Poland, Lithuania, Estonia and Finland), the rains which fell towards the end of August after a long period of drought, improved the situation, which remains good in most of these countries, notably in Czechoslovakia and Poland.

Potatoes.

COUNTRIES	AREA					CROP CONDITION (†)								
	1931	1930	Average 1925 to 1929	% 1931										
				1930 = 100	Aver. = 100	I-IX-1931			I-VIII-1931			I-IX-1930		
1,000 acres														
						a)	b)	c)	a)	b)	c)	a)	b)	c)
Germany . . . { s)	598	584 (1)	594	102.3	100.6	—	—	—	2.7	—	—	—	—	—
	6,381	6,346	6,405	100.5	99.6	2.6	—	—	2.5	—	—	2.6	—	—
Austria . . . { s)	59	59	40	100.1	127.5	2.6	—	—	2.7	—	—	2.7	—	—
	...	407	406	...	...	2.3	—	—	2.4	—	—	2.4	—	—
Belgium	402	402	408	100.0	98.1	e)	—	—	—	—	—	e)	—	—
Bulgaria	32	35	26	92.9	122.3	150	—	—	150	—	—	150	—	—
*Denmark . . . . .	...	167	173	...	...	—	—	90	—	—	94	—	—	93
*Estonia . . . . .	...	168	166	...	...	—	—	—	(2)100	—	—	—	—	—
Irish Free State . .	348	347	369	100.4	94.3	—	—	—	—	—	—	—	—	—
Finland	174	175	172	99.3	101.0	—	f)	—	—	f)	—	—	f)	—
Engl. and Wales . .	447	425	503	105.2	88.9	—	—	—	—	—	—	—	—	—
Scotland	128	123	144	103.8	88.9	—	—	95	—	—	95	—	—	—
Hungary	710	673	652	105.6	108.9	—	—	—	—	—	3.1	—	—	—
Italy	878	863	863	101.7	101.2	—	—	—	—	—	f) g)	—	—	—
Latvia	247	231	201	106.8	122.7	—	—	—	—	—	—	3.6	—	—
Lithuania	389	403	347	96.5	112.2	3.8	—	—	3.7	—	—	2.8	—	—
Luxemburg	40	40	40	99.1	99.3	2.4	—	—	2.7	—	—	—	—	—
Malta	7	7	7	90.2	97.0	—	—	—	—	—	—	—	—	—
Netherlands	401	397	432	100.9	92.7	—	—	(2) 63	—	—	(2) 62	—	—	—
Rumania	489	468	482	104.5	101.4	—	—	—	—	—	—	—	—	—
Sweden	327	336	366	97.5	89.4	—	100	—	—	—	—	105	—	—
Switzerland	113	120	117	94.2	96.7	—	—	—	104	—	—	—	—	78
Czechoslovakia . .	1,787	1,640	1,792	109.0	99.7	2.4	—	—	2.4	—	—	—	—	—
U. S. S. R.	14,838	14,378	13,477	103.2	110.1	—	—	—	—	—	—	—	—	—
Canada	576	571	552	100.8	104.3	—	—	92	—	—	—	—	—	95
United States . . .	3,506	3,187	3,869	110.7	104.1	—	—	67.4	—	—	74.3	—	—	63
*Japan	641	—	315	—	203.8	—	—	—	—	—	—	—	—	—
Syria and Lebanon .	20	17	14	120.3	144.1	—	—	—	110	—	—	—	—	—
Algeria s)	(3) 20	26	25	75.9	78.5	—	f)	—	—	f)	—	e)	—	—
Totals	32,917	31,833	31,408	103.4	104.8	—	—	—	—	—	—	—	—	—

(†) For the explanation of signs and figures indicating crop condition, see maize table and note on page 515.
 * Countries not included in the totals. — s) Early potatoes. — f) Late potatoes. — (2) Average 1927 to 1929.
 (2) Middle of current month, — (3) Not including Oran.

In the extreme South of Europe, in Italy, and Spain, and in North Africa, the crop has been prejudiced by drought, especially in Algeria, where it is very bad.

On the basis of this information and taking into account the relative importance of the different countries, particularly the prospect of relatively good yields in Poland, Czechoslovakia, Germany and France, which furnish about three-quarters of the European production, it may be stated that, if quality in general leaves something to be desired, quantity promises on the whole to be rather above the average, but considerably below that of 1930 and 1929, which were exceptionally good years.

Production in North America does not seem to vary much from the average. The September estimate of the United States shows a decrease of 6 million centals (10 million bushels) from that of August so that the crop will come midway between that of 1930 and the average, exceeding the former by 11 million centals (18 million bushels) and falling below the latter by about the same quantity. With regard to Canada, crop condition seems to indicate a crop a little below that of last year and near to the average.

Production of potatoes.

COUNTRIES	ENGLISH MEASURES			AMERICAN MEASURES			% 1931	
	1931	1930	Average 1925 to 1929	1931	1930	Average 1925 to 1929	1930 = 100	Average = 100
	Thousand centals			Thousand bushels			%	%
Germany s)	61,161	63,223	60,658	101,933	105,370	101,094	96.7	100.8
Austria s)	4,680	4,849	3,879	7,801	8,081	6,465	96.5	120.7
Belgium	60,949	65,310	74,752	101,580	108,847	124,584	93.3	81.5
Bulgaria	1,720	1,852	829	2,866	3,086	1,381	92.9	207.5
Finland	17,160	17,314	16,784	28,599	28,856	27,972	99.1	102.2
Hungary	31,810	40,597	43,333	52,682	67,660	72,221	77.9	72.9
Latvia	25,219	24,341	17,086	42,030	40,568	28,476	103.6	147.6
Luxemburg . . .	4,233	3,525	3,818	7,055	5,876	6,363	120.1	110.9
Malta	670	644	599	1,117	1,074	999	104.0	111.8
Netherlands . .	63,282	67,016	73,267	105,467	111,691	122,109	94.4	86.4
Rumania	52,382	39,993	42,587	87,902	66,654	70,976	131.0	123.0
Sweden	32,629	39,668	33,039	54,330	66,112	63,397	82.3	85.8
Switzerland . .	16,898	13,007	15,633	23,164	21,673	20,054	129.9	108.1
United States . .	216,600	205,800	223,306	361,000	343,000	380,502	105.2	94.9
Syria and Lebanon	882	754	1,027	1,470	1,257	1,711	118.0	85.0
Algeria s)	203	917	924	338	1,528	1,540	22.1	21.9

s) Early potatoes.

There is a lack of precise information for the U S S. R. It is known, however, that in the northwestern and western parts of the country and in the Ukraine, which comprise the principal area of production, the fairly frequent but none too abundant August rains created rather favourable conditions for the growth of potatoes, so that if account is taken also of the slight increase in area indicated this year, production should be larger than in previous years.

On the whole production in the northern hemisphere will apparently vary greatly as regards quality, and in quantity exceed the five year average of 1925-29, but most probably will fall below the two very good crops obtained in 1930 and 1929.

* * *

Germany : In the heavier lands the crop has been greatly affected by rot and other diseases.

Austria : Early varieties are slowly fading. At the end of August the harvest had been finished only in the lowlands. Yields leave much to be desired. The tubers are rather small. Late varieties have luxuriant leafage, but tuber formation is less satisfactory.

Belgium : Potato disease has appeared prematurely, the tubers have begun to go bad and yields may suffer.

Estonia . On August 15 the crop condition of potatoes had improved. If weather conditions remain favourable the condition of the crop may further improve and yields may be above the average of the last ten years.

Irish Free State : The second and third weeks of August were rainy. All crops show the effects of blight and where not thoroughly sprayed very serious reduction in yield is inevitable and the yield is expected to be generally below average.

France : The crop is abundant but the rainy weather of August and the beginning of September has encouraged mildew and rot so that a good part of of the crop leaves much to be desired as regards quality.

Great Britain and Northern Ireland : The outlook for the main potato crop has been adversely affected by the prolonged continuance of dull and wet weather. Reports of disease are very general and though in some areas the yield is expected to be about average it is almost certain that there will be a larger proportion than usual of unsound tubers, while it is generally feared that the tubers will not keep well. Unfortunately spraying has not been generally practised. Yield per acre in England and Wales is expected to be 5 $\frac{1}{2}$ tons, or about $\frac{3}{4}$ ton below the ten-year average and 1 ton below that of 1930. In Northern Ireland the main crop is reported to be generally in fair to poor condition.

Italy : Vegetative development of early varieties is satisfactory, but late varieties have felt the effects of the exceptionally dry weather.

Hungary : Toward the end of August early varieties were already lifted. Yields have been poor and the tubers are generally small. Late varieties may be improved by the rains of August.

Lithuania : Weather in August was unfavourable.

Luxemburg : The excessive humidity has caused rot in some districts. Crop condition on 1 September was 2.4, that is from good to average.

Poland : The yield per acre this year is expected to be rather above that of last year ; owing, however, to the slightly smaller area this year production will probably be no greater than that of 1930.

Switzerland : The persistent rains at the end of August and beginning of September caused great damage and owing to wet rot, a deficit is expected particularly on heavy,

compact soils. The harvest has been greatly interrupted by bad weather and partly rendered impracticable.

Czechoslovakia : Rainfall in August has greatly improved the crop condition of potatoes.

SUGAR

This year, weather conditions have not been very favourable to the growth of sugar beet in European countries as a whole, but from the beginning of June to the beginning of September, although the weather was changeable in every country and varied from country to country, crop condition showed a constant slight improvement.

The weather in August, at first generally warm and sunny, afterwards turned cold and rainy without, however, causing injury to the crops and in many cases favouring them. On September 1, the general condition of beet was a little superior to that on August 1, in Germany, Austria, Bulgaria, Spain, France, Lithuania, the Netherlands, Czechoslovakia and Yugoslavia and nearly unchanged in the remainder of the European beet producing countries. In some countries, the sugar content is lower but still remains fairly high and even if it falls below the very high level of last year, it is still above the average.

Only very few preliminary estimates of probable production of sugar beet this year are possessed and it would be premature to attempt to formulate those which are

Acreage of Sugar Beet.

COUNTRIES	1931 (1)	1930	Average 1925 to 1929	% 1931	
				1930 = 100	Average = 100
				%	%
Acres					
Germany	872,129	1,157,194	1,062,529	75.0	82.0
Austria	106,000	89,000	61,846	119.0	172.0
Belgium	140,000	140,178	162,316	100.0	86.0
Bulgaria	37,000	48,789	34,946	76.0	106.0
Denmark	74,000	81,000	93,088	92.0	80.0
Spain	240,000	208,960	182,438	115.0	131.0
Irish Free State	8,200	14,389	14,211	57.0	57.0
Finland	4,900	3,090	5,296	162.0	94.0
France	620,000	679,480	583,647	91.0	106.0
Great Britain	234,000	348,920	165,415	67.0	141.0
Hungary	141,776	183,315	167,850	77.0	84.0
Italy	265,981	276,626	225,722	96.0	118.0
Latvia	7,000	5,900	—	125.0	—
Netherlands	91,225	142,196	157,114	64.0	58.0
Poland	408,000	457,000	510,179	89.0	80.0
Rumania	37,000	120,948	166,863	31.0	22.0
Sweden	91,200	91,146	77,983	100.0	117.0
Switzerland	3,600	3,040	3,657	104.0	86.0
Czechoslovakia	441,389	553,598	674,813	80.0	65.0
Turkey	19,769	11,120	19,739	178.0	100.0
Yugoslavia	120,000	147,798	110,277	84.0	112.0
Total Europe . . . a)	3,563,169	4,763,687	4,475,394	83.0	89.0
U. S. S. R.	3,692,500	2,832,000	1,626,471	130.0	227.0
Total Europe . . . b)	7,655,669	7,595,687	6,101,865	101.0	125.0
Canada	52,000	52,500	45,854	99.0	113.0
United States	754,000	821,000	675,416	92.0	112.0
Total America . . .	806,000	873,500	721,270	92.0	112.0
General Total . . { a)	4,769,169	5,637,187	5,196,664	85.0	92.0
b)	8,461,669	8,469,187	6,823,135	100.0	124.0

a) Not including the U.S.S.R. — b) Including the U.S.S.R. — (1) Approximate data. — (2) Average 1927 to 1929.

lacking. In view, however, of the large diminution in the beet area, the rather adverse course of the season and the attacks of disease to which the crops have been subjected, it may be considered that the decrease in beet production compared with last year will be a little larger than that in area. For the U. S. S. R. also, according to the first and still very uncertain news, the forecasted increase in production of beet should be smaller than the increase in area.

Production of Sugar Beet

COUNTRIES	ENGLISH MEASURES			AMERICAN MEASURES			% 1931	
	1931	1930	Average 1925 to 1929	1931	1930	Average 1925 to 1929	1930 = 100	Average = 100
	Thousand centals			Thousand short tons			%	%
Belgium	37,519	41,123	40,705	1,876	2,056	2,035	91.2	92.2
Bulgaria	5,291	6,889	4,247	265	344	212	76.8	124.6
Hungary	19,665	32,210	32,947	983	1,610	1,647	61.1	59.7
Netherlands	25,653	47,127	46,341	1,283	2,356	2,317	54.4	55.4
Sweden	21,164	26,787	19,238	1,058	1,339	902	79.0	110.0
U. S. S. R.	374,787	334,434	186,203	18,739	16,721	9,810	112.1	201.3
United States . . .	142,600	184,000	147,105	7,130	9,200	7,355	77.5	96.9

According to these indications, if no notable improvement takes place before the now imminent harvest, while the beet area in Europe including the U. S. S. R., is practically equal to that of last year, production should be a little smaller.

The diminution of production forecasted in the United States, like that in Europe, is larger than the diminution of area sown.

* * *

Austria : The beet was considerably improved by the rains in the latter half of August. The roots are slowly beginning to acquire vigour.

Irish Free State : The crop is average. There has been no trouble from insect pests.

France : The figures published by the Confédération Générale des Planteurs de Betteraves indicate a considerable reduction in area to 566,000 acres instead of 640,000 in 1930, these figures being 50,000-60,000 acres under the complete official figures. On the other hand the area of beets for distilling has increased from 80,600 to 89,000 acres,

The period from 15 August to 15 September was favourable to the development of leaves and bulbs, but the abundant rain and the insufficiency of heat considerably lowered sugar content. When account is taken, in addition, of the irregularity of the stand and of the large proportion of late sowings, the amount of sugar produced is likely to be very considerably below that of last year.

Great Britain and Northern Ireland : Sugar-beet was generally reported in England and Wales to be in fairly satisfactory condition but the bulbs are on the small side. Drier and sunnier weather is required to improve the sugar content which is expected to be below average. Yield of beet will probably be below average in all areas. In Scotland also the lack of sunshine has affected the crop and it seems probable that yields will be rather disappointing.

Sugar Beet.

COUNTRIES	CROP CONDITION (†)								
	1-IX-1931			1-VIII-1931			1-IX-1930		
	a)	b)	c)	a)	b)	c)	a)	b)	c)
Germany	2.6	—	—	2.6	—	—	2.5	—	—
Austria	2.7	—	—	—	3.0	—	2.8	—	—
Belgium	e)	—	—	—	—	—	d)	—	—
Bulgaria	120	—	—	120	—	—	150	—	—
Denmark	—	—	92	—	—	94	106	—	—
Scotland	—	—	95	—	—	90	—	—	—
Netherlands	—	—	(1) 56	—	—	(1) 62	—	—	—
Sweden	—	—	97	—	—	—	119	—	—
Czechoslovakia	2.6	—	—	2.7	—	—	—	—	—
Canada	—	—	91	—	—	—	—	—	—
United States	—	—	76.4	—	—	78.9	—	—	85.2

(†) For the explanation of signs and figures indicating crop condition, see maize table and note on page 515.

(1) Middle of current month.

Hungary : The long drought has left its mark on the beet. The leaves are yellow and the roots leave much to be desired. The August rains will certainly have had a good effect on the remaining growth.

Italy : Pulling of beets has begun ; production is expected to be smaller but of high sugar content.

Czechoslovakia : The crop condition of sugar beet, thanks to abundant rains in August, has greatly improved.

U. S. S. R. : During August rains fell rather frequently but were scarce over most of the sugar beet areas.

In the first ten days of September the sugar beet harvest, which this year has been somewhat delayed by unfavourable weather, was in general progress.

Despite some increase in the use of machinery for the harvesting and transport of beet, there is a shortage of labour for harvesting and particularly for transporting beet to the factories.

According to the programme established by the Government, the area under beet in 1932 should be 4,077,000 acres compared with 3,693,000 in 1931, that is, about 10 % larger ; it should be noted that in 1931 the area was increased by 30.7 % over that of 1929.

India : Area under sugar-cane in 1931-32 is 2,825,000 acres against 2,585,000 in 1930-31, an increase of 109.3 %, and 2,663,000 on the average of the five years ending 1929-30, an increase of 106.1 %.

In Bihar and Orissa the crop was reported to be doing well in the earlier part of September.

In the United Provinces, which in the five years ending 1929-30 averaged about 51.0 % of the total area under the crop in India., rooting and shooting is reported to have been good almost everywhere, but the crop suffered to some extent from hot winds and insects. A yield of 80 % was anticipated in August and the area in the Provinces was estimated at 1,538,000 acres against the estimate of 1,415,000 acres at the corresponding period of the last year and the actual acreage of 1,488,400.

Sugar Season 1931-32. — Analysis of Sugar Beets.

Countries	Average weight of root			Average weight of leaves			Sugar content			Weight of sugar per root		
	1931	1930	1925-1929	1931	1930	1925-1929	1931	1930	1925-1929	1931	1930	1925-1929
	ozs	ozs	ozs	ozs	ozs	ozs	%	%	%	ozs	ozs	ozs
3RD WEEK OF AUGUST												
Belgium	16.1	13.3	11.8	23.9	27.7	22.6	13.6	14.0	13.3	2.2	1.8	1.6
Netherlands	15.2	19.3	(1) 12.7	—	—	—	14.5	15.3	(1) 12.5	2.2	3.0	(1) 1.6
4TH WEEK OF AUGUST												
Germany	13.4	15.0	11.5	17.1	19.0	17.9	15.2	15.0	14.8	2.0	2.2	1.8
Denmark	9.5	11.4	10.8	12.2	14.0	14.8	13.6	14.1	14.4	1.3	1.6	1.6
France	14.1	12.9	11.6	20.8	—	17.0	14.1	14.8	15.1	2.0	1.9	1.7
Czechoslovakia	15.7	12.8	13.5	15.2	13.2	15.0	15.7	14.9	15.2	2.5	1.9	2.0
LAST WEEK OF AUGUST												
Denmark	10.9	13.1	(2) 9.7	13.1	14.0	(2) 12.0	14.7	15.4	(2) 16.3	1.6	2.0	(2) 1.6
Finland	12.6	14.8	(2) 8.1	23.0	22.3	(2) 17.5	12.1	12.0	(2) 12.2	1.5	1.8	(2) 1.0
Czechoslovakia	16.9	14.3	(3) 14.0	15.2	13.7	(3) 16.4	16.1	15.4	(3) 15.1	2.7	2.2	(3) 2.1
1ST WEEK OF SEPTEMBER												
Germany	15.5	17.0	13.6	17.5	21.1	17.6	15.7	15.5	15.8	2.4	2.6	2.2
Belgium	18.6	18.1	—	24.1	30.4	—	15.2	14.0	—	2.8	2.6	—
Denmark	12.4	14.5	13.0	13.3	14.6	15.6	14.9	16.3	15.2	1.9	2.4	2.0
Finland	14.5	16.7	(4) 10.6	24.0	22.3	(4) 25.6	13.7	13.3	(4) 12.6	2.0	2.2	(4) 1.4
France	15.0	15.3	(5) 13.8	22.8	22.3	(5) 17.4	14.2	17.1	(5) 15.8	2.2	2.6	(5) 2.2
Czechoslovakia	17.7	15.4	14.7	14.5	13.0	14.5	16.6	16.6	16.2	3.0	2.6	2.4
2ND WEEK OF SEPTEMBER												
Germany	16.3	18.5	14.9	17.9	20.3	18.0	16.0	16.1	16.3	2.6	3.0	2.4
Denmark	13.1	15.8	14.5	13.4	15.1	15.6	16.0	16.8	15.7	2.1	2.7	2.3
Finland	15.9	18.9	(6) 13.9	27.5	24.3	(6) 23.7	14.0	14.3	(6) 13.1	2.2	2.7	(6) 1.8
France	16.9	16.8	(7) 15.3	23.3	21.9	(7) 18.6	15.6	16.7	(7) 15.1	2.6	2.8	(7) 2.3
Czechoslovakia	18.8	16.2	15.6	14.2	13.0	13.8	17.1	17.4	16.9	3.2	2.8	2.6
3RD WEEK OF SEPTEMBER												
Germany	18.1	19.0	(8) 16.0	17.6	19.5	(8) 18.7	17.0	16.5	(8) 16.2	3.0	3.1	(8) 2.6
Finland	15.8	19.4	(4) 12.9	25.2	24.2	(4) 26.9	15.9	16.6	(4) 15.1	2.5	3.0	(4) 2.0
France	17.6	20.0	(6) 16.1	21.7	22.4	(6) 18.1	16.7	16.2	(6) 16.4	2.9	2.8	(6) 2.6

(1) Year 1927. — (2) Year 1929. — (3) Average 1925 to 1927. — (4) Average 1925, 1928 and 1929. — (5) Average 1925 and 1929. — (6) Average 1925 and 1927 to 1929. — (7) Average 1925 to 1927 and 1929. — (8) Average 1925 to 1928.

Egypt: The excessive heat of August accelerated development of sugar cane. Irrigation water was adequate in the latter half of the month. Growth proceeded satisfactorily and cane formation is general throughout Upper Egypt. Crop condition on 1 September was 101 against 100 on 1 August last and on 1 September 1930.

Kenya: The data published last month refer not to production of sugar cane but to that of cane-sugar, 204,000 centials (10,200 sh. tons) in 1930-31 and 149,000 (7,450) in 1929-30. The industry is developing actively.

Union of South Africa: During July conditions in Northern Zululand were dry, windy and cold and not favourable to the cane. No rain had fallen in parts of the lower Umfolozi district since January. Along the South Coast of Natal and the lower portion of the North Coast (*i. e.* north of Durban) good rains, however, fell in July, being, in fact, exceptionally heavy on the South Coast, where considerable damage was caused to roads and bridges.

VINES

In the period August 15 to September 15, the vineyard situation was marked by the same general characteristics as in the preceding period.

The vineyards of South France and those of Danubian and southeastern Europe (Yugoslavia, Bulgaria, Rumania and Hungary) derived great benefit from the August rains, gathering of grapes, which has already begun or is about to begin in most of these regions, shows good results, as regards both quantity and quality.

On the contrary, the more northern vineyards, in France those of Bordelais, in the West, in the Loire valley, in Burgundy, in Champagne and in Alsace and those of central Europe (Luxemburg, Germany, Switzerland and Austria), have suffered from persistent bad weather, almost continual rains accompanied by flood and hailstorms and lack of warmth and sun, these conditions are injurious to ripening and have given rise to rotting nearly everywhere and attacks of cryptogamic disease which, however, have so far not been very grave; further, vine moth seems to have caused some damage. Quality particularly seems to have been somewhat prejudiced, while quantity remains fairly abundant; a period of fine weather may yet, on the whole, permit a fair harvest.

Vines.

COUNTRIES	AREA					CROP CONDITION (†)								
	1931	1930	Average 1925 to 1929	% 1931										
				1930 = 100	Aver. = 100	I-IX-1931			I-VIII 1931			I IX-1930		
						1,000 acres					a)	b)	c)	a)	b)	c)	a)	b)	c)
Germany	204	203	201	100.5	101.4	2.3	—	—	1.9	—	—	2.6	—	—
Austria s)	...	77	80	...	...	1.8	—	—	1.7	—	—	1.9	—	—
Bulgaria	217	205	189	106.0	114.8	150	—	—	150	—	—	150	—	—
Spain . . . . .	...	3,242	3,429	...	...	—	—	—	—	—	—	—	—	—
Luxemburg	3	3	4	100.0	84.5	—	—	—	—	—	—	—	—	—
Switzerland . . . . .	...	35	35	...	...	—	—	—	—	—	95	—	—	—
Czechoslovakia	47	44	42	105.5	111.3	—	—	—	—	—	—	—	—	—
Syria and Lebanon	124	126	123	98.6	101.2	—	—	—	e)	—	—	—	—	—
Algeria { s) t)	675 730	601 671	(1) 528 (1) 595	112.2 108.9	127.8 122.6	—	f)	—	e)	—	—	e)	—	—
French Morocco	29	18	15	163.7	200.8	—	—	—	e)	—	—	—	—	—
Tunis	98	87	74	113.1	133.5	—	—	—	—	f)	—	e) f)	—	—

(†) For the explanation of signs and figures indicating crop condition, see *maize* table and note on page 515. —
s) Area bearing. — t) Total area. — (1) Average 1926, 1928 and 1929.

The Italian and Spanish vineyards have continued to suffer rather seriously from the drought; in Spain, moreover, phylloxera has ravaged many areas hitherto untouched. In these regions, quality, at least, seems to be good.

With reference to North Africa, the result is already known.

It is still too early to establish, with a degree of certainty, an estimate of production; it is, however, possible to revise, on the basis of indications provided by crop conditions in the vineyards and information from private sources, the approximate estimate given last month. The French crop would thus appear to be about 1,230-1,250 million Imperial gallons (1,480-1,500 million American gallons); that of Italy would roughly equal last year's crop at about 770-790 million Imperial gallons (925-950 million American gallons); according to private information, the Spanish crop should be about a quarter or a third less than the normal; it may apparently be placed between 350-440 million Impe-

rial gallons (420-530 million American gallons); the Portuguese crop, similarly affected by drought, apparently can hardly exceed 110-130 million Imperial gallons (130-160 million American gallons). Danubian and southeastern Europe, including Greece, should furnish 418-484 million Imperial gallons (500-580 million American gallons) and central Europe (see the preceding classification), 88-110 million Imperial gallons (106-132 million American gallons). If, for North Africa, production is taken to approach that of last year, that is, roughly 330 million Imperial gallons (396 million American gallons), it is seen that the total crop of the northern hemisphere may be placed between 3,300-3,520 million Imperial gallons (3,960-4,230 million American gallons). Weather conditions from now until the end of the harvest can hardly modify these quantitative results, but rather quality in the vineyards which have already suffered due to bad weather.

The markets have become quiet nearly everywhere both for home and foreign trade; August was, however, marked by a strong current from Italy towards France. In general, with the exception of certain French vineyards producing fine wines, the Danubian countries, Yugoslavia particularly, and Germany, there remains little wine from the last crop in producers' hands. It is estimated that a large quantity of wines unsold in the South of France are of the inferior type which it would be difficult to market; in Italy, the situation seems to be similar, and private information indicates a figure for stocks at the beginning of August of 110-130 million Imperial gallons (130-160 million American gallons), a quantity which should be still further reduced at the end of the season; in Spain, little remains. On the contrary, in France and Italy, the trade is fairly well burdened.

The disposal of wines of poor quality from the previous crop together with other factors have caused continued fall in quotations in France; prices have fallen by 4 francs per degree-hectolitre for wines of the third quality since the beginning of August; in Italy, the same process of liquidation has produced a rather analogous result, although to a much less pronounced degree; in Danubian Europe, the prospect of a good crop and the fears concerning its storage, as most of the casks are still full, have also precipitated a fall in quotations; the Spanish market, on the contrary, is very firm, with a tendency to rising quotations.

In the southern hemisphere, an attack of black spot is reported in Australia, in the vineyards of Victoria and New South Wales due to wet weather in June and July; in Argentina, phylloxera has appeared in the vineyards of San Juan and Río Negro. The Australian wine export trade is being maintained, but prices continue to fall.

* * *

Germany: The cool and rainy weather of August generally hindered further development of the bunches, but favoured activity of parasites. The bad weather has in some districts been particularly harmful.

Austria: The bunches are well developed and the grapes luscious. Maturing was fairly well advanced early in September but sugar content was not satisfactory. In the current season a very large proportion of the bunches have been cut for table grapes.

Bulgaria: Development proceeded normally in August. There are no reports of damage by disease or bad weather.

France: The latter half of August was marked by conditions similar to those in the first half of the month: the weather was dry and relatively warm in the South and extremely rainy with low temperatures and weak sunshine in the other regions.

In the South gathering was almost general at the beginning of September, fulfilling practically all expectations with regard to both quantity, which is a good average, and quality, the fruit being healthy and the alcoholic content and acidity appearing to be normal. Storms in the first week of September have caused only local damage and have, on the contrary, encouraged the growth of grapes still to be picked. The third generation of eudemis will arrive too late to cause serious damage.

On the contrary, in the other vineyards, the persistence of bad weather has been injurious; ripening has been checked, rotting has set in to a disquieting extent in some areas and, in addition, eudemis has caused fairly appreciable loss, especially in the East; there is general fear of a third generation of eudemis. Rainstorms accompanied by hail, have occurred in most regions, causing floods; damage is, in some cases, important but fairly localised. Quality, even more than quantity, is endangered in these regions.

At the end of August, it was possible, on the basis of information from private sources, to estimate the coming crop at about 1,232 million Imperial gallons (1,479 million American gallons). Since then, gathering results have made it necessary to slightly raise the estimates for the four departments of the South from 572 million Imperial gallons (687 million American gallons) to 616 million (740 million); on the contrary, the forecasts for the other vineyards must apparently be lowered by 22 million Imperial gallons (26 million American gallons) to 44 million Imperial gallons (53 million American gallons) so that the total of crop declarations seems to amount to 1,232-1,254 million Imperial gallons (1,479-1,506 million American gallons).

Apart from serious misfortune, the weather conditions which may occur from now until the harvest in most of the vineyards will have more influence on quality than on quantity.

The above estimate is made naturally, by a comparison with the declaration of previous years. Now the recent law will oblige vine growers to make more precise declarations and this may result in a change of a purely statistical kind.

A large fall took place on the markets in August, especially for wines of inferior quality; prices of wines from the coming crop are established at a level rather below the present quotations for wines of the 1930 crop, at least for the good wines. Imports of foreign wines in July-August were relatively large. In the South stocks in producers' hands seem to be rather low, whereas in the other areas, especially those producing fine wines, Bordelais, Burgundy, nearly one-quarter to one-third of the last crop remains in producers' hands. Commercial stocks are being slowly reduced; on September 1, they were 11 million Imperial gallons (13 million American gallons) below those on September 1, 1930.

Hungary: Toward the end of August ripening proceeded under satisfactory conditions. The rains in August contributed to the increase in grapes.

Italy: The vines show still more distinctly signs of being affected by lack of moisture.

Luxemburg: Owing to the persistent rains there is a threat of cryptogamic disease and partial rot. Quality of the must seems seriously affected. Crop condition on 1 September was average.

Rumania: At the end of August crop condition was generally very good.

Argentina: Not only the province of Mendoza but those of San Juan and Río Negro have been affected by phylloxera.

The Government has extended to these provinces the requisite preventive measures to check the spread of the disease.

Palestine. The vintage began toward the end of July in the plains both in the north and the south. In the hill vineyards the grapes are ripening off. Yields are only moderate but the crop is abundant owing to the greatly increased areas under vines.

Algeria: Despite the persistent drought of August, the vines, thanks to the humidity and coolness of the nights, have maintained, on the whole, good growth. The last generation of eudemis and cochineals has caused significant damage, especially in the Mededgda and the Sahel.

The vintage is drawing to a close in the littoral plains of the east and centre, is far advanced in the west and on the coasts of the Sahel and has not yet begun in the highlands. A further estimate of production has not been published since that of July but the persistence of the unfavourable conditions mentioned above makes it probable that the figure of 305.8 million Imp. galls. (367.2 million Amer. galls.) given previous to the vintage will not be attained; this year's crop will, therefore, be smaller than that of 1930, though it is not yet possible to state the deficit with precision. On the other hand, quality is expected to be satisfactory.

Tunisia. The crop has almost everywhere been seriously damaged by the scirocco, which has greatly reduced yields. The estimate at the end of August shows a reduction on that of the preceding month. Production of grapes should be 2,650,000 centals (132,500 short tons) a decrease of about 8 % on last year and an increase of about 8.3 % on the 1925-29 average. Wine output should be 18 million Imperial gallons (21 million American gallons), 4 (5) million less than last year (—20 %) and 13 (15) million below the quinquennial mean. This is very small when it is considered that this year there are 1,900 acres more in production than last year and 3,800 more than the average. To find yields less than the 205 Imp. gall (246 Amer. gall.) per acre of this year it is necessary to go back to the disastrous vintage of 1921.

OLIVES

Production of olive oil in the two most important producing countries, Spain and Italy, promises to be rather low this year. In Spain flowering took place under good conditions but was too profuse with little formation of fruit, the olive trees further suffered notably from drought and production is forecasted to be poor. In Italy, due to the shortage of water, dropping of fruit during July and August caused considerable damage in some provinces and particularly in the South.

Prospects are better, however, in North African countries; Algeria and Tunisia anticipate a combined crop smaller than the exceptional one of 1929-30 but certainly much larger than that of 1930-31 which amounted to 695,000 centals (9,137,000 American gallons) of oil; in the Italian colonies hot winds, especially in the spring, generally hindered growth, but the situation is judged to be fairly good.

In Greece and the eastern countries, the course of the season was on the whole, favourable; the production of oil in Greece is estimated to be very abundant and only 10 % below the maximum of 1928-29.

In Syria and Lebanon and in Palestine yields are expected to vary from average to good.

Italy: Shedding has been still further accentuated.

Palestine: Berries are developing well. Good yields are expected save in a few hill areas. Crop condition on 1 August was good.

Algeria. Fruiting, which was greatly reduced by the scirocco, is very irregular as between one district and another but on the whole remains average. Crop condition shows an improvement since last month, since, if it remains *average*, it should now have risen from 75 to 85, on 1 September 1930 it was 71

Such information on production as is available indicates that it will be at least one-third below that of 1929-30, but certainly much above that of 1930-31

Tunisia. The scirocco caused a rather heavy fall of fruit but on the other hand completely arrested the development of cryptogamic diseases. Crop condition on 1 September was thus judged *fairly good* and reckoned at 120, above that of last month (100) and that on 1 September 1930 (75 to 100). The coming crop promises very well: 1,320,000 centals (17,400,000 Amer. galls.) in place of 400,000 (5,200,000) last year (330 %) and 880,000 (11,600,000) on the average of the five years ending 1929-30 (150 %).

COTTON

The September report of the United States Department of Agriculture has slightly raised the estimate of production made in August following the statement that the area abandoned after July 1 is relatively small (1.5 % against a ten year average of 4 %) and that, at the beginning of September crop condition remained high. The production forecasted, despite a reduction of about 10 % of the area cultivated, exceeds by nearly 13 % that obtained in 1930 and by nearly 3 % the average of the preceding quinquennium.

Cotton.

COUNTRIES	AREA SOWN					CROP CONDITION (†)										
	1931/32	1930/31	Average	% 1931/32		I-IX-1931			I-VIII-1931			I-IX-1930				
			1925/26	1930/31	Aver.	a)	b)	c)	a)	b)	c)	a)	b)	c)		
			to 1929/30												= 100	= 100
Thousand acres																
Bulgaria	16	14	11	118.5	147.8	125	—	—	125	—	—	—	100	—		
U. S. S. R.	5,825	3,870	1,974	150.5	205.1	—	—	—	—	—	—	—	—	—		
United States . . .	(1) 40,889	(2) 45,091	(2) 44,882	90.7	91.1	68.0	—	—	74.9	—	—	—	—	58.2		
Mexico	326	393	472	82.9	69.1	—	—	—	—	—	—	—	—	—		
Korea	461	463	495	99.6	93.0	—	—	—	—	—	—	—	—	—		
India	13,926	14,878	15,412	93.6	90.4	—	—	—	—	—	—	—	—	—		
Syria and Lebanon .	76	73	58	104.0	131.1	—	—	—	e)	—	—	—	—	—		
Algeria	3	10	15	31.4	21.3	—	f)	—	—	—	—	—	—	—		
Egypt	1,747	2,162	1,823	80.8	95.3	—	—	—	—	—	—	—	—	—		
Total	63,269	66,954	63,147	94.5	97.1	—	—	—	—	—	—	—	—	—		

(†) For the explanation of signs and figures indicating crop condition, see maize table and note on page 515. —
(1) Acreage remaining for harvest as on 1st September. — (2) Acreage picked.

Ginning is proceeding very slowly compared with past years. Apart from the fact that in years of abundant production there is a certain slowness of harvesting operations, it seems that this year there will also be a slight delay in ripening. But the principal cause may be found in the very low prices ruling, which do not encourage farmers to hasten, and in the great uncertainty which reigns concerning the future in relation to the various measures projected to meet the crisis.

In Egypt, weather conditions seem to favour a good production, but it is feared that yields will be low owing to the hindrance to harvesting operations by the poor financial condition of the farmers. Some private estimates permit the anticipation of a diminution of 15 % compared with the final figure of production of last year.

At present, harvesting is general throughout the country, including the area of Sakkariadis; but the arrivals at Alexandria are very small. The situation is serious and the Government is using all means to prevent its further deterioration, particularly by active propaganda abroad conducted personally by members of the Government to increase the consumption of Egyptian cotton. The Government has taken the initiative of calling, in October at London, an international conference, with the object of deciding on the means suitable to obtain an equilibrium of world production and consumption of cotton and particularly on the reduction of the areas to be sown to cotton. In the country itself, the Government has, among other things, adopted the following measures : (1) The institution of a commission to examine the expenses incurred from the time of harvest to the arrival of the cotton at the foreign ports of destination, and to reduce such expenses to a minimum ; (2) the appropriation from the General State Reserve of 1 million Egyptian pounds for the assistance of rural proprietors ; (3) the concession of delayed payment of agricultural rents due for the current agricultural year 1930-31 ; (4) the reduction by 50 % (from 20 to 10 piastres) of the fixed duty levied on every *Kantar* of ginned cotton produced in Egypt ; this refers only to the crop of this year.

In India, the crop condition of cotton is normal.

* * *

Argentina : The persistent and excessive rains of the last few months have seriously damaged the crop in the Chaco, which is the leading producing region, so that it is in great part lost. In the province of Corrientes, where conditions are very favourable to the crop, the Government is making active propaganda for the increase of area by means of free distribution of selected seed.

United States : Crop condition was reported good in mid-September. Shedding has been on a small scale. Picking was progressing under favourable weather conditions.

A cotton crop of 15,685,000 bales of lint (74,974,000 centals) is forecast for the United States, based upon conditions as of 1 September, as against a crop of 15,584,000 bales (74,492,000 centals), 1 August forecast ; 13,932,000 bales (66,595,000 centals), actually ginned in 1930 ; 15,268,000 bales (72,983,000 centals), 1925-1929 average. Respective percentages : 100.6, 112.6 ; 102.7. The month of August was generally favourable to the development of the cotton crop, except in the Delta sections of Arkansas and Mississippi, where weather conditions tended towards excessive growth of the cotton plant, accompanied by poor fruiting and increase in weevil numbers and activities. The loss in these sections, however, was largely offset by conditions favouring fruiting and maturing of the crop elsewhere in the Cotton Belt.

Cotton ginned from crop of 1931-32 season, excluding linters, to close of business on 15 August : 90,000 running bales (counting round bales as half-bales), as against 7,000 on 1 August ; 573,000 on 15 August 1930 ; 304,000 on 15 August 1929. To close of business on 31 August : 565,000 running bales, as against 1,880,000 in 1930 ; 1,568,000, in 1929 ; 957,000 in 1928 ; 1,534,000, in 1927.

Mexico : Production in the current season is calculated at 1,011,000 centals (211,000 bales) against 809,000 (169,000) last year and 1,208,000 (253,000), the average of the five years ending 1929. Percentages 124.9 and 83.6.

St. Vincent : Data for production in 1930-31 are not yet known but the season ended on 15 May has in general given satisfactory results.

India : According to a telegram of 12 September crop condition is normal. In the Central Provinces the wet weather caused waterlogging and excessive growth of weeds with consequent stunting. In Sind wilt was reported toward the end of August in the Samrao district.

Algeria : Production of ginned cotton this year is 10,800 centals (2,260 bales) a decrease of 57.4 % on that of last year (25,353 centals, 5,304 bales), a decrease of 60.7 on the average of the five years ending 1929-30 (27,456 centals, 5,744 bales).

Egypt : In the first half of August the weather was very hot and favoured development and ripening of the bolls in Lower and Middle Egypt, despite morning mist and, in the Sakellaridis district, a certain degree of nocturnal humidity. In Upper Egypt, on the other hand, the weather was cloudy and unfavourable. In the latter half of the month the weather continued to be very hot and on the whole favourable to the development of the plants and ripening of the bolls. Water was just sufficient in the first days of August; subsequently conditions improved a little, though the need for water continued to be felt, especially for crops at the ends of canals and those that could be irrigated only comparatively late. Toward the middle of the month, beginning with the new rise of the Nile, the situation sensibly improved and at the end of August was already normal. The scarcity of water this year is comparable only to that in 1914, it has certainly resulted in a crop not sufficiently irrigated in the last few months, and in damage that cannot be evaluated till after the harvest. It seems certain that yields will be inferior to the very low ones of last year, especially in Upper Egypt. As to damage by parasites, the situation is on the whole better than in the last few months and than last year, whether through the success of the means employed to combat them or through the heat. The proportion of crops attacked by boll-worm at the end of August was as follows: 34 % for Sakellaridis; 45 % for Ashmuni and Zagna in Lower Egypt; 30 % for Upper Egypt. At the end of August the opening of the bolls was general in the early crops of Lower Egypt; while it had hardly begun in the ordinary crop, Sakellaridis was rather late. In Upper Egypt picking was general toward 20 August, and some days in advance of last year. It appears that growers will make the first and second picking at the same time in order to reduce expenses.

Eritrea. In the western lowland plain sowing was begun toward the middle of August.

Uganda : Weather in July was generally favourable to cotton, which, in almost all parts of the Eastern Provinces, Buganda and Northern Province was developing well after excellent germination. Sowings were begun in a quarter of the Western Province, particularly in the district of Tovo, while in the Eastern Provinces and Buganda they were exceptionally forward at the same date, reaching at the end of July 498,000 acres against 263,000 in the previous season at the same date (190 %).

It is too early to forecast the 1931-32 crop, but the experience of recent years shows that, other things being equal, early-sown cotton gives better yields than late-sown, thanks to the more favourable weather during its later period of development; since this year's sowings were especially early it may be hoped that, provided seasonal conditions are not too adverse, production in 1931-32 will be considerably above the average.

Union of South Africa : Production is estimated at 35,000 centals (7,300 bales) in 1930-31, a decrease of 46.7 % on 1929-30 and of 36 % on the mean of the five years ending 1928-29.

FLAX

The still very scarce data of production of flax for fibre do not allow the formulation of an estimate, even if largely approximate, of world production this year; but on the basis of available information on the areas sown and on the condition of crops at the beginning of September, a preliminary estimate may be attempted of the probable volume of production.

Flax.

COUNTRIES	AREA					PRODUCTION										
	1931	1930	Aver.	% 1930		1931	1930	Aver.	1931	1930	Aver.	% 1931				
			1925	1930	Aver.			1925			to	1925	1929	1930	Aver.	
			to					1929				= 100				= 100
1,000 acres	1,000 centals	1,000 pounds														

Fibre.

Germany.	16	27	49	59.8	33.4	—	—	—	—	—	—	—	—
Austria †)	8	8 (1)	11	99.0	77.0	72	127 (1)	152	7,181	12,604 (1)	15,225	56.6	47.2
Belgium.	36	56	59	63.6	60.5	192	325	580	10,156	32,490	57,950	58.9	44.1
Bulgaria.	1	1	1	154.3	210.1	3	3	1	331	282	147	126.2	224.9
Estonia.	45	80	89	55.6	50.1	...	237	221	...	23,745	22,084	...	...
Finland (2). . . .	10	14	18	72.7	74.6	...	35	35	...	3,527	3,508	...	...
Hungary †). . . .	44	36	7	123.0	—	...	869	—	...	80,913	—	...	—
Italy. . . . .	...	18	18	...	...	...	56	56	...	5,553	5,639	...	...
Latvia (2).	104	128	163	81.1	63.7	342	424	487	34,167	42,395	48,714	80.6	70.1
Lithuania (2). . .	124	204	211	60.5	58.5	...	642	802	...	64,188	80,199	...	...
Netherlands. . . .	16	37	37	43.2	43.2	95	230	253	9,480	22,957	25,346	41.3	37.4
Czechoslovakia. .	27	31	52	87.9	53.3	...	123	238	...	12,816	23,764	...	...
U. S. S. R.	7,489	5,553	4,267	134.9	175.5	...	9,449	7,064	...	944,904	708,425	...	...

Linsced.

Thousand bushels
of 56 pounds.

Austria.	8	5	8	163.9	111.1	20	19	27	36	34	49	104.4	73.0
Belgium.	36	56	59	63.6	60.5	127	233	287	227	417	512	54.4	44.3
Bulgaria.	1	1	1	154.3	210.1	4	4	2	8	7	3	119.5	244.6
Italy.	24	24	44	102.5	55.5	...	125	206	...	223	368	...	...
Latvia (2).	104	128	163	81.1	63.7	344	410	452	613	733	808	87.3	75.9
U.S.S.R.	7,489	5,553	4,267	134.9	175.5	...	...	13,255	...	...	23,670	...	...
Canada.	599	582	563	103.0	106.3	1,544	2,463	2,553	2,758	4,399	4,558	62.7	60.5
United States. . .	3,132	3,692	2,909	84.8	107.7	6,003	11,967	11,713	11,800	21,369	20,917	55.2	56.4
India.	3,020	2,802	3,392	107.8	89.0	8,467	8,512	8,348	15,120	15,200	15,800	99.5	95.7
Eritrea.	2	—	10	—	31.2	9	—	38	16	—	68	—	23.1
Argentina.	3,8204	3,7523	3,6,916	109.1	118.6	...	38,581	41,099	...	68,895	73,391	...	...

†) Production expressed in dried flax straw. — (1) Average 1927 to 1929. — (2) Flax and hemp. — (3) Area sown.

It is known that the flax crop has undergone this year a large contraction in nearly all the producing countries of Europe (excluding the U. S. S. R.). In eleven countries for which estimates of area sown exist, and which last year cultivated about 6/10 of the area destined to this crop in Europe, the total reduction has been about 1/3 compared with last year ; with regard to the other countries, there is indication of notable decreases also in France and Northern Ireland. Of the principal producers, only Poland, on the basis of non-official information, should have a flax acreage not greatly different to that of 1930. On the whole, it should not be far from the truth to admit that the flax crop this year has occupied in the whole of Europe excluding the U. S. S. R., about 3/4 of the area of 1930, which reached, 1,100,000 acres.

The course of the weather has on the whole been unfavourable in the countries of north-western Europe, due to excessive rain, and in those of central Europe due to the prolonged drought, but better in the countries of northeastern Europe where it appears that nearly average yields are anticipated.

Under such conditions, taking account of the reduction in areas, it seems difficult to believe that the total production of Europe (excluding the U. S. S. R.) which in 1930 amounted to about 4 1/2 million centals, may this year exceed 3,700,000 centals.

Moreover, in the U. S. S. R., the flax crop has been very greatly extended, and the Dolgunetz variety alone, namely, the one which is grown chiefly for fibre, covers about 5,700,000 acres, exceeding that of 1930 by about 1,400,000 acres. On the assumption, confirmed by partial information for some of the principal flax producing areas of the U. S. S. R., of an average yield, the Russian production may reach about 11,700,000 centals against 9,500,000 last year, and the world crop would amount to about 15 1/2 million centals compared with nearly 14 million obtained in 1930, in which year the largest crop of the post-war period was obtained.

* * *

Austria : Flowering was satisfactory and the seed is ripening slowly.

Estonia : On August 15, the crop condition of flax had improved. Taking into consideration the large diminution in area it may be considered that production will reach about half that of last year when 23,600,000 lbs. of fibre were obtained.

France : The continual rains of August and early September caused losses to the crop, which was partly in the stack and in the fields ; quality has been lowered. In a general way the crop is not very satisfactory.

Great Britain and Northern Ireland : The reports concerning the crop in Northern Ireland are very variable. It is promising well on medium soils but on poor or heavy land very light yields are expected. The crop has not ripened well and yields are not expected to reach the average.

Hungary : A poor crop is expected, both qualitatively and quantitatively.

Latvia : Crop condition on 15 August was excellent according to 2.70 % of correspondent's replies, good in 29.17 %, average in 51.79 %, below average in 14.24 % and bad in 2.10 %. The yield is estimated at 3.3 centals (5.9 bushels) per acre for seed and 3.3 centals per acre for fibre.

U. S. S. R. : According to the Commissariat for Agriculture, the flax crop had, on September 5, been harvested on an area of 4,532,000 acres, representing 79 % of the area sown to flax for fibre in the present year. In the principal areas growing flax for fibre, harvesting had been effected to the extent of 100 % in the western region, 94.6 % in the Moscow area, 91.7 % in the Leningrad area, 90.5 % in White Russia, 90.0 %

in the Ivanovo Industrial region and 78.7 % in the Nizhniy Novgorod region. These regions cover an area representing about 9/10 of the total.

In all the other areas the relative percentages are very much lower especially in the Ural area and Siberia, where the flax crop for fibre has been notably extended in recent years.

On September 5 flax had been rippled from an area representing about one half of that harvested at the same date.

Argentina (Telegram of 17 September). Crop condition is good. Weather is generally favourable.

Palestine: Threshing was completed on 1 August under normal conditions.

HEMP

Germany. Area under hemp and other textile plants (excluding flax) is only 750 acres against 930 last year and the 1925-29 average of 3,850.

Austria. The crop has considerably improved since the beginning of August. At the beginning of September crop condition was 2.6 against 3.0 on 1 August and 2.9 on 1 September 1930. Area under hemp this season approximates to that of last year, which was 990 acres. As regards production, that of fibre is expected to be 15,400 centals against 17,890 in 1930 and 17,700, the average of 1927-29 (86.3 % and 87.2 %) and that of seed at 2,000 centals, against 1,980 in 1930 and 2,660 in 1925-29 (100.3 % and 74.7 %).

France. At the beginning of September pulling was in progress in the west in rather bad weather. August was very rainy with temperatures below normal and very weak insolation.

Hungary: A poor crop, both qualitatively and quantitatively is expected.

Italy: Hemp production will be poor due to the drought which has persisted during the spring and summer.

Syria and Lebanon: Area cultivated is 5,900 acres against 6,150 in 1930 and 6,280 on the average in 1925-29. Percentages 96.4 and 94.5. Crop condition at the beginning of August was good. Weather has so far been favourable.

OTHER PRODUCTS

Lute.

India: Harvesting progressed favourably in East and North Bengal in the latter part of August and was begun in West Bengal as the floods subsided, and in the early part of September, cutting, steeping and washing were reported as continuing.

Area this year is 1,858,000 acres, a decrease of 46.8 % on that of last year (3,492,000 acres) and a decrease of 45.0 % on the average of the five years ending 1929 (3,379,000 acres).

Production this year is 224,000 thousand pounds, a decrease of 50.6 % on that of last year (4,502,000) and a decrease of 46.3 % on the average of the five years ending 1929 (4,141,200).

Tea.

Ceylon: Weather in August was rainy as in the preceding month. Particularly abundant rains fell in the southwest. Crop condition on 1 September was average as on 1 August.

India : Throughout July the weather continued to be variable in North India ; in many districts the precipitation was excessive and crop condition was fair only. Up to the end of July a decrease of 3,500,000 lb. as compared with the production for the same period last year was recorded in North India.

In South India light south-west monsoon conditions prevailed in July and the crop was about normal. Immediate prospects are not favourable. The outturn was 2 ½ % above that to the same date last year.

Kenya : The rapid and steady increase in tea cultivation in Kenya is confirmed by figures of the last agricultural census carried out this year on 28 February instead of on 31 July. During the last six years the area under cultivation has grown from 1,690 acres in 1925-26 to 3,160 in 1926-27, 4,810 in 1927-28, 5,590 in 1928-29, 8,330 in 1929-30 and 9,900 in 1930-31. Production has also increased rapidly, the number of bushes in bearing having gradually increased, and output rising from 3,180 lb. in 1925-26 to 8,700 in 1926-27 and in succeeding years 33,400 lb., 152,800 lb., 577,800 lbs. to 930,200 lb in 1930-31. It is expected that there will, in the next few years, be further considerable increases, as many trees are coming into bearing.

Cacao.

Gold Coast : Harvesting of the *minor crop* had been finished by the beginning of September and most of it had been marketed. Weather conditions during harvesting were unfavourable for drying and the percentages of mouldy, slaty, and germinated beans in August exports exceeded the corresponding figures for July.

Major crop : In the Eastern Province the season was expected to begin at the normal time save in the Suhum district, where it will be late. Yield per acre is generally below normal. In the Central Province yield is expected to be above normal ; in the Oda district most of the crop will be ripe in October-November and harvesting will be completed early in January. In the Western Province flowering had finished by the beginning of September and harvesting was expected to begin at the end of the month, rising to a peak in November and ending early in January. The amount of the major crop to be offered will depend on price more than on production. In Ashanti the season is expected to begin slightly late owing to the dull weather and yields per acre are expected to be below normal ; in distant areas farms are likely to be neglected.

Crop movement has been as follows :

	August 1931	Average August last 4 years	October 1930 to August 1931	Average October-August last 4 years
Shipments per steamer (1,000 lbs.) . .	7,213	15,008	473,827	490,000
Arrivals by rail at Takoradi and Accra (1,000 lbs.)	900	2,343	269,519	318,631

Coffee.

Eritrea : Area is estimated at 620 acres and production at 840 centals ; crop condition on 1 August was good.

Kenya : The area under cultivation in 1931-32 is 99,200 acres against 96,600 in 1930-31 and 76,600 on the average of the five years ending 1929-30 ; percentages 102.6 and 129.5.

It is still too early to be able to give even an approximate estimate of production this season, but reports on crop condition give reason to expect that, despite the slight increase in area and the on the whole not too unfavourable weather conditions, the crop

will be considerably below the very good one obtained last season and will not greatly exceed 180,000 centals, thus showing a reduction of about 40 % on that of 1930-31 (311,000) and of about 10 % on the average of the five years ending 1929-30 (207,800).

Groundnuts.

United States : The area under groundnuts in 1931 is estimated to be 1,683,000 acres against 1,391,000 in 1930, an increase of 21 %, and 1,413,000 on the average of the five years 1925-29, an increase of 19 %.

Egypt . In August weather was favourable. Water for irrigation was inadequate in the canals but toward the end of the month, as the period of deficiency came to an end, full irrigation was renewed. Growth is satisfactory. In the early crops seeds are already formed, while late crops are flowering and the shells are just forming. Crop condition on 1 September was 98 against 97 on 1 August last and 100 on 1 September 1930.

Rapeseed and Sesame.

Germany . The area under colza and rape this year is 24,800 acres against 32,100 last year and 63,800 on the average of 1925-29. Percentages 77.5 and 38.9.

Austria . According to the most recent estimate, production of colza is 63,500 centals (127,000 bushels) against 63,100 (126,100) in 1930 and 40,700 (81,400) in 1925-29 (100.7 % and 156.0 %).

Czechoslovakia : Production of colza in the current year has been 32,900 centals (65,800 bushels) against 28,900 (57,800) in 1930 and 55,500 (111,000), the 1925-29 average. Percentages 114.0 and 59.3.

Mexico : Sowings of sesame have been made under favourable conditions. It is calculated that the area sown this year is 10 % above that of last year. Crop condition is good.

Palestine : Harvesting is in progress on the plains . Yields are poor.

Syria and Lebanon : Area under sesame is estimated at 10,000 acres against 8,900 in 1930 and 19,800, the average for 1925-29. Percentages 110.8 and 49.9. Production amounts to 44,000 centals (2,200 sh. tons) against 35,400 (1,770) in 1930 and 88,600 (4,430), the five-year average. Percentages 124.5 and 49.8. Crop condition at the beginning of August was good and weather was favourable.

Eritrea : Area under sesame is estimated at 70 acres and production at 600 centals (30 short tons) against 1,160 (58), the average for 1927-29. Crop condition on 1 August was good.

Tobacco.

Germany . Production in 1930 amounts to 464,100 centals against 509,200 in 1929 and 434,200 on the average of 1924-28. Percentages 91.1 and 106.9.

Belgium : Yield is satisfactory but drying is very difficult. Production this year is placed at 127,400 centals against 153,900 in 1930 and 153,300 on the average of 1925-29. Percentages 82.8 and 83.1.

Bulgaria : Weather in August was prevalently hot and dry. Toward the end of the month the crop was fully developed. Reports of an abundant crop of good quality are confirmed.

Hungary : After the rains in August the crop was refreshed, and has somewhat improved.

Italy : Harvesting of tobacco is in progress ; production will be deficient but quality is anticipated to be good.

Czechoslovakia : Crop condition at the beginning of September varied from average to above the average.

Canada : The crop is a good one.

United States : The estimate of production of tobacco has been raised since August to the new figure of 1,648 million lbs or 0.4 % above last year's production and 21.4 % above the average of 1925-29.

Japan : According to the most recent estimate production in 1931 is 1,480,000 centals (an increase of about 41,000 centals on the last estimate) against 1,452,000 in 1930 (102 %) and 1,422,000, the average for 1925-29 (104 %).

Palestine : Picking is in progress. Fair to good yields are expected. Crop condition on 1 August was average.

Syria and Lebanon : Area cultivated this year is 23,700 acres against 9,300 in 1930 and the 1925-29 mean of 7,500. Percentages 256.6 and 318.5. The expected production is 181,000 centals against 70,000 and 49,600 respectively ; percentages 258.1 and 364.5. The marked increase is due principally to last year's tobacco legislation.

Algeria : Production is extremely poor this year, due to reduction of area cultivated and to poor yields.

Crop condition on 1 September was *average* (90), against 75 on 1 August ; on 1 September 1930 it was *passable* (80).

It is said that production will not attain 220,000 centals.

Eritrea : Area in 1931 is 150 acres against 27 in 1927-29 ; crop condition on 1 August was excellent, production is estimated at 660 centals against 134, the average for 1927-29.

Hops.

Germany : Area has fallen this year to 25,400 acres, against 31,900 in 1930 and 36,000, the average of 1925-29. Percentages 79.6 and 70.5.

Belgium : The crop is a deficient one and its quality leaves much to be desired. It is estimated that production will be 22,700 centals, a decrease of 23.3 % on that of 1930 (29,610 centals) and of 55.6 % on the average of 1925-29 (51,180 centals).

France : The bad weather of August and the beginning of September seriously compromised the crop ; ripening and air-drying of the cones were very unsatisfactory, especially in Alsace, and quality is generally bad, while part of the cones has not been gathered. In the North a few days of fine weather in September allowed quality and quantity to be obtained to a satisfactory degree for part of the crop.

Great Britain and Northern Ireland : In England and Wales in the crop was showing the adverse effects of unfavourable weather and of the prevalence of downy mildew and pests. Development of cones was slow and picking commenced rather late. Yield per acre was forecast at 10 cwt. or about $2\frac{1}{4}$ cwt. below the ten-year average.

Hungary : An indifferent yield is expected.

Czechoslovakia : Area cultivated in the current year has been 30,500 acres against 38,100 in 1930 and an average of 35,600 in 1925-29. Percentages 80.1 and 85.7.

The abnormal crop of hops was attacked just before picking by red spider ; the rainy August weather did not contribute to improve the quality of hops in ripe condition. Due to this fact a fairly considerable part of the hops have been left standing in the fields.

Sericulture.

Japan : Production of spring cocoons this year is estimated at 435,419,000 lbs against 463,825,000 in 1930 and 386,033,000 the average of the preceding five years; percentages: 93.9 and 112.8.

The quantity of summer-autumn silkworm eggs incubated this year is 2,035,000 ounces, against 3,339,000 in 1930 and 3,537,000, the average; percentages: 87.9 and 83.0

Syria and Lebanon : Eggs placed in incubation amount to 79,400 oz. according to the August estimate, against 100,600 in 1930 and 95,900 in 1925-29. Percentages 78.9 and 82.8. Production of cocoons should, according to the same estimate, be 6,206,000 lbs against 8,047,000 in 1930 and 6,844,000, the five year average. Percentages 77.1 and 90.7.

FODDER CROPS

In Europe, except in a few regions (Central and Southern Italy, Bulgaria and central and southeastern parts of the European territory of the U. S. S. R.) where the drought and heat persists, weather during August, especially in the last three weeks, was prevalently rainy and a considerable fall in temperature occurred. The rains which fell in many regions after a period of prolonged drought, have in general been very favourable to fodder crops and particularly to permanent meadows and pastures; they were excessive in only a few countries (of which may be mentioned England and France), in some areas with unfavourable results on fodder roots.

Although numerical data of the production of the various crops in a certain number of countries are still lacking, it may be considered that, despite the rather prolonged drought in many places in June and July, favourable weather in the spring and the improvement in the situation in August have resulted in a satisfactory total European fodder production.

In North Africa, dry, hot weather has been unfavourable to the crops.

In the United States the hay crop is estimated to be poor and notably below the average as a consequence of the intense drought in the summer months.

In Canada, crop condition of fodder plants on September 1, was a little below the average and rains were needed.

In Argentina, weather conditions in August have been on the whole favourable to the meadows and pastures.

* * *

Germany : Fodder crops, meadows and pastures are luxuriant. The second cutting however, was partially brought in with great difficulty. On the whole the hay so far obtained is not up to expectations either as regards quantity or quality.

Areas under the principal fodder crops, compared with those of last year and with the averages for 1925-29 (for mangolds and turnips 1927-29) are as follows :

	1931	1930	Average	% 1931 1930 = 100	% 1931 Aver. = 100
	(thousand acres)				
Mangolds	1,933	1,824	1,773	106.0	109.0
Turnips	656	648	635	101.2	103.2
Clover	4,270	4,365	4,487	97.8	95.2
Lucerne	758	742	668	102.1	110.2
Irrigated meadows . .	998	962	931	103.7	107.2
Other meadows . . .	12,611	12,645	12,646	99.7	99.7
Pasture	6,563	6,485	6,228	101.2	105.4

Austria : At the end of August, fodder beet looked well but the roots were relatively small. Rains in the latter half of August hindered harvesting of the clover aftermath. A good third crop is forecasted of alfalfa and mixed clovers (Klee grass). The second sowing of mixed fodder and vetches is growing luxuriantly. The first sowing of maize for green fodder has given a crop of only 1,720,000 centals (86,000 short tons) against 2,293,000 (115,000) last year.

From many meadows yielding only one crop and from mountain meadows, the hay was harvested before the rainy period in the latter half of August. Yields were rather low. The total production of these meadows is 10,516,000 centals (526,000 short tons) against 11,067,000 (553,000) last year. The harvesting of aftermath from meadows capable of two cuttings has been hindered by the rains. Quality is in many cases endangered. The second cutting of meadows yielding three crops has also given only mediocre yields but of good quality: A good third crop is, however, anticipated.

On the pastures, grass recovered in growth after the rains but is not abundant. On the alpine pastures, the grass has mostly ceased growing or is so scarce that livestock cannot find adequate feed.

On September 1, the crop condition of mixed fodder and vetches was 3.0 (against 3.3 on 1 August this year and 2.9 on 1 September, 1930) ; corresponding figures for maize for green fodder are : 2.4, 2.9 and 2.6 and those for alpine pastures 2.8, 2.3 and 3.1

The production of fodder crops (first cutting), is given in the following table.

		1931	1930	1929	1928	1927
Red clover (hay)	(000 centals)	5,313	8,311	10,631	8,020	8,532
	(000 sh. tons)	266	416	532	401	427
Lucern (hay)	(000 centals)	2,249	2,932	2,260	2,326	1,896
	(000 sh. tons)	112	147	113	116	95
Mixed clover (Klee grass)	(000 centals)	2,998	3,373	3,221	2,652	3,086
	(000 sh. tons)	150	169	161	133	154
Graminaceous crops and mixed graminaceous and legum- inous crops	(000 centals)	1,168	1,587	1,437	1,459	1,587
	(000 sh. tons)	58	79	72	73	79
Permanent meadows yielding 1 or 2 crops	(000 centals)	34,062	56,130	41,313	38,427	42,020
	(000 sh. tons)	1,703	2,806	2,066	1,921	2,101
Maize for green fodder	(000 centals)	1,720	2,293	1,808	1,329	2,169
	(000 sh. tons)	86	115	90	66	108
Permanent and mountain meadows yielding a single crop	(000 centals)	10,516	11,067	...	...	...
	(000 sh. tons)	526	553	...	...	...

Belgium : Meadows and fodder crops have benefitted by the wet weather, which has, however, been unfavourable for clover seed.

Bulgaria : August was very hot and dry. In the first days of September there was abundant rain. Fodder crops have given a very good yield.

Irish Free State : Though weather in the second and third weeks of August was rainy and flooding was experienced in several districts toward the end of the third week, the last ten days of the month were very fine and on the whole the month may be said to

The Condition of Fodder Crops.

Crops and countries	Crop Condition (†)								
	September 1, 1931			August 1, 1931			September 1, 1930		
	a)	b)	c)	a)	b)	c)	a)	b)	c)
CLOVER :									
Germany	2.7	—	—	2.9	—	—	2.7	—	—
Austria (1)	2.8	—	—	—	—	3.2	2.6	—	—
Scotland	105	—	—	—	—	—	—	—	—
Estonia	—	—	(2) 97	—	—	(2) 90	(2) 122	—	—
Lithuania	113	—	—	—	—	—	113	—	—
ALFALFA									
Germany	2.5	—	—	2.6	—	—	2.5	—	—
Austria	2.8	—	—	—	—	3.3	2.9	—	—
MANGOLDS :									
Germany	2.5	—	—	2.5	—	—	2.5	—	—
Austria	2.5	—	—	2.9	—	—	2.5	—	—
Bulgaria	160	—	—	160	—	—	200	—	—
Denmark	—	—	93	—	—	91	104	—	—
Scotland	—	—	95	—	—	95	—	—	—
Finland (3)	—	—	85	—	—	84	—	—	91
Lithuania	113	—	—	106	—	—	117	—	—
Canada	—	—	94	—	—	—	—	—	93
TEMPORARY MEADOWS :									
Austria (4)	2.7	—	—	—	3.0	—	2.6	—	—
Bulgaria	110	—	—	110	—	—	115	—	—
Scotland	105	—	—	105	—	—	—	—	—
Finland	—	—	88	101	—	—	110	—	—
Sweden	116	—	—	—	—	—	112	—	—
PERMANENT MEADOWS :									
Germany { irrigated meadows.	2.3	—	—	2.4	—	—	2.3	—	—
{ other meadows	2.6	—	—	2.6	—	—	2.7	—	—
Austria	2.8	—	—	2.9	—	—	2.8	—	—
Bulgaria	150	—	—	150	—	—	150	—	—
Scotland	105	—	—	105	—	—	—	—	—
Estonia	(2) 116	—	—	(2) 115	—	—	(2) 108	—	—
Finland	—	—	99	—	—	98	—	—	98
Lithuania	103	—	—	—	—	—	108	—	—
Sweden	—	—	97	—	—	—	—	—	91
PASTURES :									
Austria	—	3.0	—	—	—	3.7	—	—	3.2
Denmark	—	—	99	—	100	—	102	—	—
Finland	—	f)	—	—	f)	—	—	f)	—
Canada	—	91	—	—	—	—	—	—	—

a) above the average. — b) average. — c) below the average. — d) above good. — e) good. — f) average. — g) bad. — h) very bad. — (†) See explanation of various systems page 515. — (1) Red clover. — (2) At the middle of the preceding month. — (3) Turnips. — (4) Klee gras.

have been favourable for haymaking and harvesting operations. Pastures provided ample feeding for stock. Portions of the mangel crop that withstood the earlier adverse conditions made good progress but yield will be below average. Turnips promise a satisfactory crop generally. The difficulty of effecting after-cultivation of turnip and mangel crops due to soil and weather conditions has resulted in heavy growth of weeds in these crops. The great bulk of the hay crop has been gathered in good condition; the yield is above average.

France : The period from 15 August to 15 September was characterised by heavy rains, mean temperature below normal and weak insolation. These circumstances were favourable to the development of fodder roots; on the other hand, in the leading stock-rearing regions the bad weather hindered cutting of the aftermath and food value of the grass is rather poor.

Harvesting of seeds hay has given a good average in the south, notably for purple clover and lucerne, but north of the Loire, and particularly in the west, these two crops have been seriously affected by the bad weather and the crop will be deficient, especially in the case of lucerne. The other seeds: yellow clover, white clover, sainfoin, black medick (*Medicago Lupulina*), promise only a small crop, though hybrid clover and lotus (*Lotus corniculatus*) are more promising, quality in general leaves much to be desired.

Great Britain and Northern Ireland : Owing to the wet season, cleaning of root crops has been very difficult and weeds are everywhere prevalent. Sun and warmth are badly needed for all crops. In England and Wales turnips and swedes are variable, the bulbs being on the small side and the yield per acre probably below average in most areas; in Scotland also the plants are smaller and irregular, while finger-and-toe is prevalent in most eastern districts, but the yield will probably be up to the average. Mangolds will probably yield under average in England and Wales, while in Scotland a fairly good crop is promised.

The protracted hay harvest was still in progress at the end of August. Except for early cuts secured in good condition, the larger part of the crop has been badly weathered and is of inferior quality. Second growths of seeds are abundant but in some districts it is doubtful if as many second cuts as usual will be taken. Aftermaths have grown well. In England and Wales the yield per acre of seeds hay is placed at about 31 cwt. or $1\frac{3}{4}$ cwt. more than in 1930 and $3\frac{1}{2}$ cwt. above the ten year average, while the yield of meadow hay is estimated at 22 cwt. or the same as in 1930 and $2\frac{1}{4}$ cwt. above the ten-year average. Pasture has continued to be very plentiful.

The following are the areas under fodder crops in Scotland.

	1931	1930	Average 1925-29	% 1930 = 100	% 1931 1925-29 = 100
	(thousand acres).				
Turnips and swedes.	365	373	383	98	95
Mangolds	1.3	1.2	1.2	106	108
Temporary meadows for hay	417	410	405	102	103
" " " " total	1,522	1,500	1,498	102	102
Permanent meadows for hay	172	171	165	101	104
" " " " total	1,477	1,569	1,513	94	98

Hungary : The drought in July was prejudicial to the development of mangolds. After the rains in August, however, the crop was somewhat improved.

The third cutting of clover and of lucerne gave poor yields. Crop condition of fodder maize and of moka has improved.

On permanent meadows the great drought has compromised the second cutting almost everywhere. Pastures have also suffered greatly from lack of moisture and have not provided adequate feed.

After the rains of August there are hopes of improvement.

Italy : The first cuttings of temporary meadows have yielded abundant crops thanks to the March-April rains but further cuttings have, on the contrary, yielded less due to the dry weather. Pastures, except in high mountain areas, have also suffered greatly from shortage of water. Alpine pasturage may be considered to be normal. Stocks of last year's hay will also be reduced due to the deficit in the present season.

Recent sowings of temporary meadows, have been endangered almost everywhere and the sowings of autumn-winter grasses have been effected only in those places where some beneficial rain has fallen.

Lithuania : Weather in August was fairly favourable.

Sweden : The area of temporary meadows this year is 3,317,000 acres against 3,302,000 in 1930 and 3,220,000, the 1925-29 average, percentage increases being respectively 0.4 and 3.0. Production is 117,573,000 centals (5,879,000 sh. tons) ; 98.3 % of that of 1930 (119,603,000 ; 5,980,000) and 110.7 % of the 1925-29 average (106,253,000 ; 5,313,000).

Area of permanent meadows is 1,301,000 acres as in 1930 and 11.3 % above the 1925-29 average (1,169,000 acres). Production is estimated at 14,506,000 centals (725,000 sh. tons) against 14,681,000 (734,000) last year and 13,157,000 (658,000) on the average. Percentages 98.8 and 110.3.

Area under fodder roots and tubers in 1931 is estimated at 251,000 acres against 210,000 in 1930, an increase of 19.4 %. Production is calculated at 70,107,000 centals (3,505,000 sh. tons) against 48,808,000 (2,440,000) in 1930, an increase of 43.6 %. Crop condition on 1 September was 100 against 106 on 1 September 1930.

Czechoslovakia : In the fairly elevated areas, the hay crop has been completely satisfactory ; a good crop of aftermath is hoped for. The condition of clover and mixed fodder on stubble is excellent.

In the lower lying areas stubble ploughing was finished at the end of August.

Canada : On 10 September it was reported that moisture was generally needed in the East, particularly in Ontario and Quebec, for pastures and root crops.

Crop condition of turnips and mangolds on 1 September was 94 compared with 93 on the same date last year ; the corresponding figures for fodder maize were 102 and 92.

Algeria : The persistent drought has still more severely affected vegetation, which is already non-existent in certain areas of the High Plateaux. In the north the stubble is sufficient to maintain the stock in good condition but in the south the situation of transhumants is becoming precarious.

LIVESTOCK AND DERIVATIVES

Condition of Livestock and Dairy Production.

Great Britain and Northern Ireland : Considering the unfavourable weather, cattle and sheep have done well as a rule in both England and Wales and Scotland but in Northern Ireland they are not so forward as usual at this time of the year, particularly in the case of lambs. Pastures are generally luxuriant but quality deteriorated owing to the wet weather. In some districts of Scotland dairy cattle required hand-feeding but supplies of fodder are ample and prices of feeding-stuffs have continued to fall.

Milk yields were about normal throughout the area. Red water is reported from some districts in Northern Ireland.

In England and Wales it is anticipated that the number of ewes kept for breeding will show an increase in most areas. In Scotland sheep on arable farms in the north and west have made good progress, but in the east and south there have been complaints of maggots and foot-rot. Hill sheep have thriven quite well, but their condition at the beginning of September was rather below average for the time of year.

Irish Free State : The winter feed position seems reasonably satisfactory. Supplies of milk to creameries have fallen below normal for this time of year.

Argentina : In the following table are given the data for 1930 production of cheese, butter and casein, compared with those for the four preceding years.

Year	Cheese	Butter	Casein
		(thousand pounds).	
1926	33,333	76,050	43,792
1927	35,661	64,323	29,499
1928	36,667	67,137	39,252
1929	34,118	61,475	37,100
1930	33,718	74,006	30,851

Only for cheese is the figure for 1930 slightly above that of 1926, though it is below the figures for 1927, 1928 and 1929. For butter 1930 show a production considerably above that of the previous year but still below that of 1926. For casein the tendency to decrease is further accentuated though production in 1930 is slightly above that of 1927, a very poor year.

United States : There were about 13 % less cattle on feed for market in the Corn Belt States on 1 August this year than on 1 August 1930. Feeders' reports as to the number of stocker and feeder cattle they expected to buy during the last five months of 1931 point to smaller shipments of such cattle into the Corn Belt States this year, particularly into the principal feeding States, due mainly, it appears, to the unfavourable returns from feeding operations during the past two years and the resulting difficulty that many feeders will meet in financing feeding operations this year.

Union of South Africa : The serious drought situation in June was relieved by very heavy precipitation in the first half of July, save in a few areas, chiefly Bechuanaland, the Western Transvaal and Zululand. In Cape Province the snow was exceptionally heavy in the northern border districts and in Griqualand East, lying to a depth of six feet in some cases; sheep were buried for days and some fairly severe losses were experienced. On the Natal South Coast the exceptionally heavy rains caused flooding and numbers of cattle and goats were washed down the rivers to the sea. The severe cold is reported to have caused a falling off in the condition of stock in those parts of Cape Province where snowfall was heavy, on the Natal South Coast, while in the Transvaal the rains are reported to have had a similar effect. With the continuance of drought, scarcity of water was reported in parts of Zululand where no rain had fallen since January and in the western Transvaal, where many springs dried up, while in the western Orange Free State feeding of stock was necessary. In certain districts of Zululand outbreaks of East Coast fever are reported.

Winter lambing results vary greatly in the West Coast districts of Cape Province, are good on the Cape Karroo, in the Transvaal and, on the whole, in the Orange Free State.

Kidding was expected to begin in August. The wool clip will be affected by the previous drought.

Springs and dams have been replenished and young grazing is assured with the advent of warmer weather. Many farmers in the West Coast districts of Cape Province who had been forced to trek for fresh grazing are now back on their farms.

In the ostrich-breeding districts of Cape Province the increased interest in ostrich feathers and consequent rise in prices has aroused considerable hopes.

(Telegram of September 16): The wool clip in the current season is estimated at about 335 million pounds greasy equivalent. For comparison it may be recalled that during the past season exports were about 285 million pounds greasy equivalent and in the preceding quinquennium 270 million. This year's clip compares favourably with that of last year in condition and in length of fibre and there is little difference in quality.

Australia: According to the National Council of Woolselling Brokers of Australia the wool position on 31 August was as follows:

	Thousand pounds	
	1931-32	1930-31
Received into store 1 July-31 August	143,038	103,723
Sold by auction or privately	3,685	3,168
Shipped unsold	496	708
In store 31 August	138,857	99,847

(Telegram of September 20): The production of unwashed wool this year is estimated at about 950 million lbs. The corresponding estimate of last year at the same period was 875 million lbs and the average production for the preceding five years was 910 million lbs.

New Zealand (Telegram of September 21): Production of unwashed wool this season is forecasted at 206,500,000 lbs. Last year 220 million lbs. were obtained and on the average for the five preceding seasons, 196 million lbs.

Livestock in Great Britain and Northern Ireland.

In England and Wales there has been a general increase in the numbers of livestock with the exception of horses which continue their downward trend. The following table gives the results of the enumeration on 4 June 1931 along with those of the preceding decade.

England and Wales.

YEAR	Horses	Cattle				Sheep	Pigs
		Total	Cows and heifers in milk	Cows in calf but not in milk	Heifers in calf		
1931	938,400	6,064,300	2,042,500	321,900	425,300	17,745,400	2,777,700
1930	961,300	5,849,800	2,033,400	288,300	352,800	16,315,800	2,310,300
1929	999,300	5,957,600	2,054,100	293,700	364,800	16,105,500	2,366,500
1928	1,038,400	6,026,000	2,066,200	301,700	355,200	16,386,100	2,967,900
1927	1,077,200	6,275,200	2,066,400	307,000	387,300	17,072,300	2,691,500
1926	1,123,800	6,253,100	2,065,100	294,000	389,600	16,868,700	2,200,000
1925	1,164,100	6,163,300	2,035,100	299,600	378,500	15,974,400	2,644,356
1924	1,232,198	5,894,329	2,014,241	281,556	367,405	14,843,195	3,228,330
1923	1,281,279	5,322,992	1,974,546	269,021	371,230	13,885,533	2,611,606
1922	1,340,495	5,722,661	1,933,086	288,634	299,321	13,438,020	2,296,936
1921	1,384,587	5,516,724	1,876,114	251,818	373,465	12,881,513	2,506,466

The total number of cattle shows an increase 3.7 % over that of 1930 but the 1927 level has not been recovered. Cows and heifers in milk have increased by only 0.4 % but the increase has been general throughout the country, being relatively most marked in the East Midland (8 %) and Eastern and South-eastern (6 %) divisions, where last year's fall was most pronounced. There is a large increase in cows in calf (11.5 %) and heifers in calf (20.5 %). The latter have in 1930 experienced a relatively heavier reduction than other classes; the new figure is a record. Two-year-olds have decreased by a further 3.6 %, but last year's decline in yearlings has given way to an increase of 12 % and the number of calves also shows an increase, which has been general throughout the country, amounting on the whole to 11.2 %.

The total number of sheep has increased by 8.8 %, against only 1.3 % in 1930, exceeding the 1927 peak and being now the highest since 1916. The increase has been general thanks, no doubt, to the good prices of recent years, and affects all classes; those one year and above show the heaviest increase (16.3 %) while the number of breeding ewes is 6.5 % above that of last year, the increase in the latter case being especially marked in the Eastern, East Midland and West Midland divisions.

The pig cycle is in an upward phase, with a general increase of 20.2 % and one of 27.2 % for breeding sows. Amongst recent years 1928, 1924 and 1921 were peaks. The present movement still indicates the influence of the higher prices previous to March 1930.

The decline in numbers of horses has been continuous since 1921, though this year the rate of decrease has slackened from 3.8 % to 2.4 %. Horses used for agricultural purposes have decreased by 2.4 % (against 3.4 % last year). The number of foals shows only a slight fall while that of unbroken horses one year and above shows the most pronounced fall (2.7 %).

In Scotland the totals for cattle and horses have decreased while those for sheep and pigs have increased.

Scotland.

Y ^{EAR}	Horses	Cattle				Sheep	Pigs
		Total	Cows in milk	Cows in calf but not in milk	Heifers in calf		
1931	153,400	1,208,500	346,400	50,000	55,400	7,697,100	154,400
1930	156,300	1,236,000	350,800	46,900	55,400	7,649,500	143,300
1929	161,000	1,232,900	355,600	46,800	51,300	7,555,500	142,200
1928	165,738	1,213,848	356,121	50,812	52,284	7,578,704	195,504
1927	172,102	1,210,450	355,460	49,273	55,584	7,535,477	196,013
1926	178,695	1,197,828	357,315	42,868	57,263	7,203,134	145,419
1925	185,433	1,204,791	348,328	49,708	52,227	7,118,820	154,220
1924	193,696	1,164,397	352,256	46,439	49,693	6,886,152	198,836
1923	203,833	1,193,590	361,742	42,132	51,489	6,785,723	186,027
1922	211,769	1,146,807	353,943	44,095	48,593	6,634,097	150,884
1921	216,621	1,143,135	346,495	41,724	54,829	6,658,511	145,498

The 2.2 % decrease in the total number of cattle follows on four years of upward movement. Cows in milk show a decrease, as in 1930, amounting this year to 1.3 %; cows in calf but not in milk, the number of which shows continual fluctuation, have increased by 6.6 %, while heifers in calf remain stationary at a figure well below the 1926 maximum. Bulls for service show a larger proportionate increase than usual (4.7 %). Calves show a slight revival, but yearlings have fallen by 3.5 % from their record of last year, though still above the 1928 figure, and two-year-olds have decreased by 9.1 %, the latter two classes of feeding cattle being mainly responsible for the smaller total this year.

The number of sheep continues to increase (0.6 %), the greatest relative increase being, as last season, in rams to be used for service in the current year (3.0 %) The total of all sheep, rams for service, ewes kept for breeding, and lambs have all reached new records but "other sheep one year and above" are still much below the 1925 record.

As was expected from the large percentage increase last year in sows for breeding and boars for service, this year shows an upward movement in the pig cycle, the increase in the total being 7.7 %. The increase in sows and boars of the above classes has continued, being respectively 8 4 % and 22 2 %.

As in England and Wales the steady decline in numbers of horses from the 1921 maximum has continued and has amounted this year to 1.9 %, the total being the smallest on record. Horses used for agricultural purposes decreased by 2.2 %. Unbroken horses one year and over show the most marked decline (4 %), as in England and Wales, while the decline in foals, which had already ceased in 1930, has been replaced by an increase (3 9 %).

For Northern Ireland the totals for the whole area are not yet available, owing to the considerable delay in collecting statistics in County Down due to the recent outbreak of foot-and-mouth disease there. The preliminary figures for the five remaining counties indicate increases for cattle, sheep, pigs and horses, and decreases for goats and kids, asses, mules and jennets, and in poultry.

Livestock in Chile.

In the following table are given the data of the livestock census of 30 June 1930, compared with those of 1925.

Year	Cattle	Horses	Asses	Mules	Sheep	Goats	Pigs
1930	2,387,940	441,027	37,455	31,414	6,263,482	788,831	331,156
1925	1,918,433	323,581	27,364	40,187	4,093,872	357,033	246,636

For all kinds except mules, increases may be noted compared with 1925, those for cattle, sheep and goats being particularly noteworthy. The largest proportional increase occurs in the case of goats, the number of which more than doubled in 1930. For mules, on the contrary, there has taken place a decrease of about 25 %

The 1930 census gives the following data with regard to the age of cattle, horses, mules, sheep and pigs.

<i>Cattle</i> :	Under 1 year	419,656
	From 1 to 3 years	683,543
	Over 3 years	1,284,741
<i>Horses</i> :	Under 1 year	27,582
	From 1 to 3 years	59,051
	Over 3 years	354,394
<i>Mules</i> :	Under 2 years	3,525
	Over 2 years	27,889
<i>Sheep</i> :	Under 1 year	1,636,553
	Over 1 year	4,626,929
<i>Pigs</i> :	Under 1 year	112,888
	Over 1 year	218,268

TRADE

COUNTRIES	JULY				TWELVE MONTHS (August 1-July 31)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1931	1930	1931	1930	1930-31	1929-30	1930-31	1929-30	1929-30	1929-30
Wheat. — Thousand centals (1 cental = 100 lbs)										
<i>Exporting Countries:</i>										
Bulgaria	505	20	0	0	3,284	66	0	0	980	—
Hungary	20	234	0	0	5,247	9,943	0	0	0	—
Lithuania	2	7	0	0	538	55	4	2	—	—
Rumania	258	185	0	0	8,589	1,279	7	40	—	—
U. S. S. R.	—	—	—	—	(1) 64,164 (1)	4,163	—	—	—	—
Yugoslavia	403	220	0	0	3,247	13,298	0	2	—	—
Canada	7,203	11,020	13	7	137,150	93,461	79	602	—	—
United States	7,639	7,161	985	802	46,355	57,283	11,616	7,835	—	—
Argentina	3,576	2,156	—	—	71,033	86,889	—	—	—	—
Chile	—	—	—	—	(2) 428 (2)	312 (2)	0 (2)	0	—	—
India	123	1,369	500	64	2,216	2,692	6,581	3,931	—	—
Turkey	13	7	0	0	265	24	7	414	—	—
Algeria	—	—	—	—	(3) 5,315 (3)	2,535 (3)	540 (3)	525	—	—
Tunis	955	586	13	2	3,704	3,362	—	99	—	—
Australia	6,433	1,463	0	0	70,505	24,469	0	0	—	—
<i>Importing Countries:</i>										
Germany	0	4	2,593	1,995	265	2,293	18,805	31,725	—	—
Austria	0	29	679	375	86	68	5,815	6,457	—	—
Belgium	503	4	3,781	2,308	2,079	895	30,082	25,794	—	—
Denmark	2	0	397	254	35	123	4,877	2,908	—	—
Spain	0	0	0	7	4	11	0	2,152	—	—
Estonia	0	0	31	53	0	0	370	640	—	—
Irish Free State	—	—	—	—	(2) 18 (2)	0 (2)	5,919 (2)	5,079	—	—
France	0	2,520	8,148	915	968	8,907	46,604	20,020	—	—
Gr. Brit. and N. Ir.	44	93	13,415	10,774	683	1,482	124,551	114,048	—	—
Greece	0	0	1,065	1,032	0	0	14,233	12,839	—	—
Italy	0	0	1,932	3,305	22	4	50,116	27,150	—	—
Latvia	0	0	51	193	0	0	1,019	1,523	—	—
Norway	—	—	229	154	—	—	3,126	2,216	—	—
Netherlands	9	15	1,001	1,265	683	231	16,599	14,921	—	—
Poland	123	24	0	88	1,847	289	49	331	—	—
Portugal	—	—	284	582	—	—	1,816	3,732	—	—
Sweden	0	4	143	450	31	1,003	2,879	4,982	—	—
Switzerland	0	0	1,019	959	2	0	11,096	9,590	—	—
Czechoslovakia	0	13	694	238	4	103	7,079	3,605	—	—
Japan	—	—	1,096	672	—	—	15,311	10,922	—	—
Syria and Lebanon	—	—	—	—	(2) 134 (2)	13 (2)	37 (2)	146	—	—
Egypt	—	—	—	—	(2) 2 (2)	13 (2)	1,014 (2)	11	—	—
Union of South Africa	—	—	—	—	(2) 0 (2)	0 (2)	1,407 (2)	1,559	—	—
New Zealand	—	—	—	—	(2) 0 (2)	130 (2)	126 (2)	161	—	—
Totals	27,827	28,636	38,102	26,699	434,853	315,348	381,396	316,291		
Rye. — Thousand centals (1 cental = 100 lbs)										
<i>Exporting Countries:</i>										
Germany	0	525	29	24	1,213	10,529	690	1,922	—	—
Bulgaria	44	0	0	0	1,413	9	0	0	—	—
Hungary	33	33	0	0	1,679	2,919	0	0	—	—
Poland	121	677	2	2	5,880	7,293	2	20	—	—
Rumania	35	7	0	0	1,208	377	0	0	—	—
Czechoslovakia	0	49	467	13	476	1,625	844	254	—	—
U. S. S. R.	—	—	—	—	(4) 11,023 (4)	1,268	—	—	—	—
Yugoslavia	0	0	0	0	0	33	4	0	—	—
Canada	68	0	0	0	1,171	194	0	150	—	—
United States	0	9	—	—	90	1,373	—	—	—	—
Argentina	166	31	—	—	1,003	767	—	—	—	—
Turkey	15	15	0	0	308	168	0	81	—	—
Algeria	—	—	—	—	(3) 35 (3)	31 (3)	0 (3)	4	—	—
<i>Importing Countries:</i>										
Germany	0	0	90	267	9	2	2,306	2,867	—	—
Belgium	4	2	412	108	126	7	3,739	983	—	—
Denmark	0	0	335	529	4	2	7,324	6,158	—	—
France	0	0	11	106	0	0	194	1,920	—	—
Italy	2	2	130	254	2	4	1,570	3,314	—	—
Netherlands	0	0	44	11	0	7	1,378	181	—	—
Poland	0	0	4	46	0	0	597	324	—	—
Portugal	0	0	9	192	0	7	390	2,194	—	—
Sweden	0	7	0	0	163	86	0	24	—	—
Switzerland	0	0	223	108	0	0	3,023	3,905	—	—
Czechoslovakia	64	7	312	379	791	90	6,323	2,906	—	—
Japan	0	0	26	123	4	11	520	2,240	—	—
Syria and Lebanon	0	0	18	4	0	0	174	154	—	—
Totals	552	1,354	2,196	2,369	26,368	26,592	28,847	29,336		

COUNTRIES	JULY				TWELVE MONTHS (August 1-July 31)				TWELVE MONTHS (August 1-July 31)	
	IMPORTS		EXPORTS		EXPORTS		IMPORTS		IMPORTS	EXPORTS
	1931	1930	1931	1930	1930-31	1929-30	1930-31	1929-30	1929-30	1929-30
Wheat flour. — Thousand cents (1 cental = 100 lbs).										
<i>Exporting Countries:</i>										
Germany	2	37	44	28	123	1,226	233	710	—	—
Belgium	22	12	11	11	216	265	231	573	—	—
Bulgaria	20	0	0	0	220	7	0	0	—	—
Spain	7	2	0	0	75	66	0	0	—	—
France	814	573	37	44	7,350	3,796	569	392	—	—
Hungary	66	123	0	0	4,008	5,664	0	0	—	—
Italy	84	31	15	11	1,179	1,400	225	93	—	—
Latvia	0	4	0	0	73	42	2	2	—	—
Poland	22	9	2	2	615	154	24	35	—	—
Rumania	—	—	—	—	(5) 291	(5) 146	(5) 0	(5) 0	—	—
Yugoslavia	0	11	0	0	88	320	2	2	—	—
Canada	915	1,202	2	7	13,113	13,285	49	143	—	—
United States	1,960	1,852	0	0	23,164	25,208	2	2	—	—
Argentina	139	172	—	—	1,889	2,604	—	—	—	—
Chile	—	—	—	—	(2) 99	(2) 190	(2) 0	(2) 0	—	—
India	51	88	0	0	1,014	1,113	2	2	—	—
Turkey	0	2	0	2	20	7	11	75	—	—
Japan	187	179	9	20	3,472	2,304	212	379	—	—
Algeria	—	—	—	—	(3) 234	(3) 93	(3) 37	(3) 46	—	—
Tunis	18	20	0	0	251	159	11	4	—	—
Australia	717	701	0	0	10,404	9,165	0	0	—	—
<i>Importing Countries:</i>										
Austria	2	2	626	494	13	4	3,100	3,761	—	—
Denmark	2	106	126	126	24	31	1,572	1,433	—	—
Estonia	0	0	2	13	—	0	88	123	—	—
Irish Free State	—	—	—	—	(2) 37	(2) 46	(2) 3,360	(2) 3,336	—	—
Finland	—	—	170	207	—	—	2,150	2,487	—	—
Gr. Britain and N. Ir.	399	406	1,060	1,082	4,608	4,727	12,316	12,437	—	—
Greece	—	—	9	24	—	—	165	494	—	—
Norway	0	0	117	110	2	2	1,396	1,376	—	—
Netherlands	7	11	346	324	115	203	3,354	2,700	—	—
Portugal	—	—	20	15	—	—	218	152	—	—
Sweden	0	4	4	22	2	90	71	379	—	—
Czechoslovakia	2	2	22	214	11	13	2,432	3,333	—	—
Ceylon	—	—	40	44	—	—	445	430	—	—
Java and Madura	—	—	—	—	—	—	(2) 908	(2) 1,056	—	—
Indo-China	—	—	—	—	—	—	(2) 408	(2) 483	—	—
Syria and Lebanon	—	—	—	—	(2) 18	(2) 0	(2) 152	(2) 406	—	—
Egypt	—	—	—	—	(2) 0	(2) 4	(2) 3,265	(2) 4,511	—	—
Union of South Africa	—	—	—	—	(1) 9	(1) 24	(1) 262	(1) 459	—	—
New Zealand	—	—	—	—	(2) 2	(2) 4	(2) 214	(2) 166	—	—
Totals	5,440	5,636	2,642	2,807	72,755	72,362	38,491	42,089		
Barley. — Thousand cents (1 cental = 100 lbs).										
<i>Exporting Countries:</i>										
Bulgaria	24	13	0	0	1,598	309	0	0	—	—
Spain	11	20	0	0	152	163	0	9	—	—
Hungary	0	11	0	0	580	2,363	4	0	—	—
Lithuania	0	4	0	0	15	143	0	0	—	—
Poland	7	132	0	0	2,798	5,794	0	2	—	—
Rumania	357	1,866	0	0	32,203	31,365	0	0	—	—
Czechoslovakia	2	0	0	0	2,003	2,518	4	15	—	—
U. S. S. R.	—	—	—	—	(4) 22,962	(4) 9,137	—	—	—	—
Yugoslavia	4	9	0	0	29	282	130	150	—	—
Canada	1,274	4	0	0	9,240	1,250	0	9	—	—
United States	300	267	—	—	5,022	8,774	—	—	—	—
Argentina	157	110	—	—	5,501	2,575	—	—	—	—
Chile	—	—	—	—	(2) 459	(2) 796	(2) 0	(2) 0	—	—
India	192	13	0	0	302	28	2	11	—	—
Syria and Lebanon	—	—	—	—	(2) 880	(2) 435	(2) 4	(2) 20	—	—
Turkey	97	0	0	0	593	51	0	7	—	—
Algeria	—	—	—	—	(3) 1,378	(3) 2,013	(3) 225	(3) 126	—	—
Egypt	—	—	—	—	(2) 2	(2) 64	(2) 110	(2) 35	—	—
Tunis	22	98	2	15	220	2,452	390	53	—	—
Australia	42	35	0	0	1,552	324	0	0	—	—
<i>Importing Countries:</i>										
Germany	0	141	3,388	2,392	62	1,089	17,906	49,785	—	—
Austria	0	0	152	55	0	9	2,077	1,638	—	—
Belgium	55	37	575	390	1,076	176	10,588	7,867	—	—
Denmark	2	2	1,005	869	1,232	1,232	15,007	4,458	—	—
Estonia	—	—	0	4	—	—	13	73	—	—
Irish Free State	—	—	—	—	(2) 20	(2) 26	(2) 284	(2) 351	—	—
France	0	20	496	24	22	348	7,716	1,437	—	—
Gr. Britain and N. Ir.	0	0	1,259	862	63	53	18,691	14,454	—	—
Greece	—	—	0	2	—	—	79	401	—	—
Italy	0	0	22	33	0	9	787	875	—	—
Latvia	0	0	7	4	0	0	212	123	—	—
Norway	0	0	49	71	0	0	1,073	762	—	—
Netherlands	9	9	1,100	664	591	487	14,720	7,917	—	—
Switzerland	0	0	223	163	0	0	2,829	1,313	—	—
Totals	2,555	2,776	8,276	5,548	91,544	74,543	92,806	91,975		

COUNTRIES	JULY				TWELVE MONTHS (August 1-July 31)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1931	1930	1931	1930	1930-31	1929-30	1930-31	1929-30	1929-30	1929-30
Oats. — Thousand centals (1 cental = 100 lbs).										
<i>Exporting Countries:</i>										
Germany	0	342	143	18	220	15,245	1,005	620	—	—
Irish Free State	—	—	—	—	(2) 251	(2) 639	(2) 375	(2) 93	—	—
Hungary	0	11	24	0	13	728	141	0	—	—
Lithuania	0	4	0	0	84	179	0	0	—	—
Poland	4	141	0	0	137	1,803	0	66	—	—
Rumania	0	245	0	0	1,095	1,831	0	0	—	—
Czechoslovakia	0	60	123	2	710	1,345	143	128	—	—
U. S. S. R.	—	—	—	—	(4) 9,513	(4) 1,008	—	—	—	—
Yugoslavia	0	0	2	4	2	0	86	51	—	—
Canada	425	104	0	0	2,659	679	234	1,182	—	—
United States	11	172	0	0	130	1,576	198	49	—	—
Argentina	904	459	—	—	14,451	6,508	—	—	—	—
Chile	—	—	—	—	(2) 2,430	(2) 569	(2) 0	0	—	—
Algeria	—	—	—	—	(3) 1,036	(3) 340	(3) 126	(3) 110	—	—
Tunis	37	97	0	0	545	858	9	0	—	—
<i>Importing Countries:</i>										
Austria	0	0	238	110	2	2	2,227	2,707	—	—
Belgium	0	0	337	214	4	4	3,491	2,773	—	—
Denmark	0	0	119	176	20	20	1,270	2,800	—	—
Estonia	0	0	0	4	0	0	159	106	—	—
Finland	0	0	68	51	7	0	260	470	—	—
France	0	4	190	60	20	77	2,213	1,671	—	—
Gr. Brit. and N. Irel.	11	9	1,325	690	397	306	10,697	9,658	—	—
Greece	—	—	0	0	—	—	0	207	—	—
Italy	0	0	64	163	0	0	3,741	1,700	—	—
Latvia	0	66	0	0	4	163	57	99	—	—
Norway	0	0	0	13	4	2	4	170	—	—
Netherlands	9	9	366	170	375	185	3,600	3,728	—	—
Sweden	0	2	218	90	40	60	1,334	1,290	—	—
Switzerland	0	0	317	309	2	0	4,564	4,398	—	—
Australia	2	4	0	0	73	49	2	4	—	—
Totals	1,403	1,819	3,534	2,074	34,424	34,188	35,948	34,095		

Maize. — Thousand centals (1 cental = 100 lbs).

COUNTRIES	JULY				TWELVE MONTHS (August 1-July 31)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1931	1930	1931	1930	1930-31	1929-30	1930-31	1929-30	1929-30	1929-30
Maize. — Thousand centals (1 cental = 100 lbs).										
<i>Exporting Countries:</i>										
Bulgaria	130	238	0	0	3,287	3,073	0	0	4,017	0
Hungary	2	73	280	20	236	3,305	1,988	24	3,351	132
Rumania	1,411	4,363	0	0	14,335	25,183	0	2	28,424	2
Yugoslavia	240	917	2	0	6,255	10,580	0	11	12,013	33
United States	276	185	15	20	1,080	3,854	498	234	4,303	708
Argentina	21,012	11,632	—	—	123,653	61,610	—	—	96,331	—
Brazil	—	—	—	—	(2) 18	(2) 311	—	—	328	—
Java and Madura	—	—	—	—	(2) 1,920	(2) 1,607	—	—	1,759	—
Indo-China	—	—	—	—	(2) 1,647	(2) 1,250	—	—	2,339	—
Syria and Lebanon	—	—	—	—	(2) 150	(2) 313	(2) 49	(2) 13	434	35
Egypt	—	—	—	—	(2) 4	(2) 18	(2) 86	(2) 11	20	33
Union of South Africa	—	—	—	—	(1) 1,032	(1) 2,004	(1) 0	(1) 0	12,267	0
<i>Importing Countries:</i>										
Germany	0	0	1,428	1,808	0	0	6,639	13,878	0	16,506
Austria	0	4	608	328	2	15	4,012	3,446	18	4,312
Belgium	79	13	1,631	1,362	661	176	11,565	8,964	220	12,903
Denmark	0	0	1,825	474	0	0	8,109	4,687	0	6,250
Spain	0	0	269	26	0	0	2,749	3,448	0	3,847
Irish Free State	—	—	—	—	(2) 26	(2) 20	(2) 6,799	(2) 4,790	29	8,048
Finland	—	—	44	13	—	—	172	84	—	—
France	0	11	1,995	1,122	37	42	14,859	11,023	46	17,357
Gr. Brit. and N. Ir.	247	207	4,198	2,190	1,744	1,490	35,453	23,738	2,150	36,306
Greece	—	—	76	33	—	—	320	170	—	—
Italy	0	0	1,570	1,127	7	7	11,147	11,812	7	15,253
Norway	—	—	172	254	—	—	2,632	1,975	—	—
Netherlands	13	82	2,723	1,404	231	507	22,139	18,718	626	23,177
Poland	0	0	84	82	0	4	419	328	4	362
Portugal	—	—	51	205	—	—	1,184	966	—	—
Sweden	—	—	745	340	—	—	4,557	1,861	—	—
Switzerland	0	0	243	141	2	0	2,154	1,650	0	2,551
Czechoslovakia	0	0	1,288	572	0	0	8,708	5,999	2	5,447
Rumania	0	0	351	808	—	—	3,206	5,798	4	6,571
United States	0	0	117	101	—	—	1,540	1,267	—	—
Totals	28,410	17,225	24,791	12,013	51,343	115,472	151,166	130,914	158,694	169,916

COUNTRIES	JULY				SEVEN MONTHS (January 1-July 31)				TWELVE MONTHS (January 1-Dec. 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1931	1930	1931	1930	1931	1930	1931	1930	1930	1930

Exporting Countries:

	1931	1930	1931	1930	1931	1930	1931	1930	1930	1930
Spain	57	90	0	0	437	705	0	0	1,252	0
Italy	143	289	7	0	1,841	2,588	33	115	4,716	134
United States	104	126	7	9	1,664	1,455	254	186	2,621	293
Brazil . . . . .	...	...	—	—	(2) 1,045	(2) 249	—	—	844	—
India	3,728	4,030	13	0	32,260	44,802	300	18	57,318	139
Indo-China . . . . .	...	...	—	—	(2) 11,603	(2) 13,638	—	—	24,727	—
Siam	1,022	1,312	—	—	14,989	13,596	—	—	20,598	—
Egypt . . . . .	...	...	...	...	(2) 478	(2) 569	(2) 86	(2) 137	1,206	251

Importing Countries:

	1931	1930	1931	1930	1931	1930	1931	1930	1930	1930
Germany	150	185	1,091	573	730	937	4,592	3,428	1,594	5,503
Austria	0	0	49	55	0	0	302	362	0	606
Belgium	13	0	190	132	99	4	763	650	9	1,047
Denmark	0	0	9	11	0	0	90	71	0	139
Estonia	—	—	4	4	—	—	18	20	—	35
Irish Free State . . . . .	...	...	...	...	0	0	(2) 31	(2) 26	0	46
France	55	154	463	511	538	1,166	3,236	2,981	1,903	5,650
Gr. Brit. and N. Ir.	20	22	223	103	137	152	1,579	1,576	218	2,564
Greece	—	—	57	51	—	—	331	309	—	236
Hungary	0	0	55	37	0	7	304	134	9	383
Latvia	0	2	22	13	0	4	80	20	7	62
Lithuania	0	0	2	4	0	0	15	18	0	31
Norway	—	—	13	11	—	—	79	66	—	101
Netherlands	328	216	772	547	1,565	1,257	3,924	2,910	2,035	3,563
Poland	68	40	539	2	183	68	974	644	126	1,177
Portugal	—	—	49	150	—	—	348	593	—	941
Sweden	—	—	0	0	—	—	123	181	—	181
Switzerland	0	0	35	29	0	0	234	192	0	408
Czechoslovakia	0	0	101	77	0	0	600	542	0	979
Yugoslavia	0	0	42	44	2	2	202	214	2	516
Canada	0	0	53	24	0	0	545	439	0	584
Chile . . . . .	—	—	...	...	—	—	(2) 293	(2) 328	—	513
Ceylon	0	0	918	871	13	4	5,938	6,052	9	10,369
Java and Madura . . . . .	...	...	...	...	(2) 84	(2) 22	(2) 3,395	(2) 4,176	117	5,487
Japan	423	7	251	280	3,042	150	1,543	2,504	1,252	3,973
Syria and Lebanon . . . . .	...	...	...	...	(2) 0	(2) 2	(2) 154	(2) 152	2	320
Turkey	0	0	18	20	0	2	95	104	2	203
Algeria . . . . .	...	...	...	...	(3) 0	(3) 0	(3) 46	(3) 40	9	104
Tunis	0	0	2	2	0	0	20	13	0	24
Union of S. Africa . . . . .	...	...	...	...	(1) 0	(1) 0	(1) 414	(1) 390	0	960
Australia	7	7	2	4	86	46	20	49	71	75
New Zealand . . . . .	...	...	...	...	(2) 0	(2) 0	(2) 51	(2) 49	0	66
Totals	7,023	6,490	5,033	3,618	70,886	81,425	32,169	39,347	129,647	48,363

Linseed. — Thousand centals (1 cental = 100 lbs).

Exporting Countries:

	1931	1930	1931	1930	1931	1930	1931	1930	1930	1930
Estonia	0	0	0	0	2	2	0	0	55	2
Lithuania	7	0	0	0	123	55	0	0	443	—
Argentina	3,708	1,268	—	—	28,909	16,449	—	—	25,496	—
India	251	922	0	0	1,462	4,286	0	0	5,793	0
Tunis	2	4	0	0	2	7	0	0	9	0

Importing Countries:

	1931	1930	1931	1930	1931	1930	1931	1930	1930	1930
Germany	2	2	511	454	9	24	5,083	3,347	26	3,132
Belgium	24	2	201	193	64	51	2,335	1,009	68	1,776
Denmark	—	—	46	37	—	—	279	220	—	639
Spain	—	—	35	40	—	—	232	212	—	430
Finland	0	0	4	18	0	0	44	55	0	30
France	0	0	298	366	13	9	3,177	2,213	15	5,223
Gr. Brit. and N. Irel.	0	2	562	454	4	9	4,713	2,513	9	5,223
Greece	0	0	9	9	0	2	51	85	2	2
Hungary	2	2	0	9	11	9	2	92	143	—
Italy	0	0	75	97	0	0	272	339	0	6
Latvia	4	0	7	7	55	53	56	57	249	—
Norway	—	—	22	37	—	—	234	325	—	—
Netherlands	2	7	710	672	44	122	4,034	3,573	149	—
Poland	0	0	31	22	4	15	256	112	34	—
Sweden	—	—	117	96	—	—	741	329	—	—
Czechoslovakia	0	0	51	15	2	4	399	214	—	—
Yugoslavia	0	0	26	35	0	2	261	47	—	—
Canada	148	0	0	13	449	110	17	479	933	—
United States	—	—	944	201	—	—	4,454	2,323	—	—
Japan	—	—	8	15	—	—	230	192	—	—
Australia	0	8	36	37	0	0	234	192	—	—
Totals	4,450	3,299	3,693	2,581	21,157	21,267	32,000	22,277	39,222	—

COUNTRIES	JULY				SEVEN MONTHS (January 1-July 31)				TWELVE MONTHS (January 1-Dec. 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1931	1930	1931	1930	1931	1930	1931	1930	1930	1930
Exporting Countries:										
Austria	13	29	406	194	1,182	1,817	1,457	487	4,112	545
Denmark	36,946	34,932	46	134	236,925	222,229	1,019	959	372,558	1,389
Estonia	4,676	4,707	0	0	17,112	18,085	0	0	31,010	0
Irish Free State . . . . .	...	...	...	...	(2) 12,573	(2) 19,703	(2) 3,148	(2) 2,754	58,815	3,391
Finland	4,389	3,463	0	0	25,823	25,516	0	0	37,726	7
France	911	1,468	1,836	300	5,505	6,605	30,785	9,581	12,095	12,024
Hungary	108	51	4	40	809	1,162	117	40	8,430	40
Latvia	6,462	4,722	2	2	23,407	22,377	20	26	40,630	49
Lithuania	3,556	2,970	0	0	10,875	8,402	0	0	16,219	0
Netherlands	6,424	8,821	811	238	46,123	56,613	3,530	1,874	92,394	4,396
Poland	4,852	4,213	4	2	16,757	14,491	24	13	26,714	29
Sweden	4,550	4,930	2	0	27,719	35,858	17	15	58,857	18
U. S. S. R.	—	—	—	—	—	—	—	—	23,149	—
Argentina	146	2,765	—	—	28,590	28,508	—	—	51,156	—
India	13	35	35	26	198	346	201	159	551	232
Syria and Lebanon . . . . .	...	...	...	...	(2) 996	(2) 1,087	(2) 121	(2) 37	2,161	172
Australia	8,644	3,042	0	2	102,626	60,409	0	2	126,411	2
New Zealand	14,614	8,439	—	—	128,343	130,646	—	—	208,170	—
Importing Countries:										
Germany	22	98	19,989	33,019	165	443	122,527	162,911	578	293,560
Belgium	276	322	3,915	1,495	1,545	1,534	22,723	11,524	2,648	22,412
Spain	11	0	7	20	62	106	40	139	161	328
Gr. Brit. and N. Irel.	1,191	946	90,529	60,603	23,021	8,395	536,986	464,851	21,028	764,732
Greece	—	—	212	179	—	—	981	785	—	1,420
Italy	77	82	293	33	1,122	1,404	4,698	1,314	1,744	3,115
Norway	123	0	95	293	1,219	229	174	564	230	1,530
Switzerland	0	2	1,492	1,288	4	20	13,706	10,551	42	18,786
Czechoslovakia	0	4	432	77	302	452	2,630	870	694	714
Canada	2,145	141	2	439	4,511	540	2,915	33,149	1,179	38,005
United States	183	205	88	95	1,393	2,048	818	1,967	2,967	2,471
Ceylon	—	—	35	40	—	—	377	443	—	723
Java and Madura	—	—	—	—	—	—	(2) 4,265	(2) 4,325	—	7,557
Japan	—	—	15	35	—	—	143	411	—	611
Algeria	—	—	—	—	(3) 24	(3) 24	(3) 1,362	(3) 1,288	82	3,232
Egypt	—	—	—	—	(2) 15	(2) 9	(2) 1,199	(2) 1,273	42	2,417
Tunis	0	0	44	53	2	2	520	492	13	829
Totals	99,732	86,391	129,251	98,612	708,945	667,516	756,363	712,304	1,197,572	1,186,336
Butter. — (Thousand lbs.)										
Exporting Countries:										
Denmark	730	1,285	44	46	5,307	7,147	355	392	12,626	809
Finland	395	351	0	0	3,682	2,346	18	18	4,633	35
Italy	4,769	2,773	717	1,012	49,000	44,772	5,858	7,028	30,802	12,560
Lithuania	269	870	2	0	1,320	1,071	7	4	1,960	11
Norway	194	68	33	46	1,193	681	333	392	1,350	750
Netherlands	19,656	22,527	106	132	110,849	119,601	710	314	206,739	1,510
Poland	289	463	57	81	1,702	1,506	465	620	3,267	1,074
Switzerland	4,991	6,442	419	237	33,715	39,239	3,512	2,562	66,146	4,261
Czechoslovakia	520	692	437	364	4,612	3,933	1,993	1,725	8,274	2,963
Yugoslavia	368	600	22	26	1,893	1,623	148	176	4,583	300
Canada	11,497	12,092	141	88	19,310	22,053	820	1,032	66,955	1,779
Australia	229	851	0	2	3,455	2,762	15	139	7,273	150
New Zealand	7,423	14,588	0	0	119,381	129,149	2	2	201,256	7
Importing Countries:										
Germany	602	401	12,065	16,458	3,585	2,873	70,178	78,145	5,410	137,459
Austria	571	392	536	562	3,435	1,612	3,892	3,636	4,482	5,637
Belgium	88	99	4,682	5,082	470	496	27,758	23,382	880	51,394
Spain	20	20	254	421	168	117	2,006	3,058	207	5,836
Irish Free State . . . . .	...	...	...	...	(2) 44	(2) 57	(2) 1,171	(2) 1,118	194	2,350
France	2,205	2,469	6,352	5,637	19,429	23,878	45,310	33,539	38,921	65,524
Gr. Brit. and N. Irel.	717	871	26,096	29,959	4,248	5,256	139,764	199,144	8,027	345,592
Greece	9	2	218	97	115	161	2,017	1,634	262	2,302
Hungary	7	11	4	15	75	49	168	245	98	386
Switzerland	—	—	79	79	—	—	348	417	—	1,010
Canada	—	—	66	82	—	—	844	705	—	1,470
United States	157	176	3,413	3,106	1,118	1,356	33,656	43,682	2,180	68,913
Algeria	0	0	46	106	—	2	478	575	7	1,188
Java and Madura	—	—	—	—	—	—	(2) 741	(2) 752	—	1,671
Syria and Lebanon	—	—	—	—	(2) 66	(2) 97	(2) 357	(2) 323	132	780
Egypt	—	—	—	—	(3) 77	(3) 79	(3) 2,826	(3) 3,948	212	10,897
Tunis	2	2	57	104	(2) 58	(2) 85	(2) 3,882	(2) 3,556	60	7,556
Totals	55,708	67,521	56,899	63,772	388,399	412,049	491,158	418,735	727,890	759,748
Cheese. — (Thousand lbs.)										

COUNTRIES	JULY				TWELVE MONTHS (August 1-July 31)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1931	1930	1931	1930	1930-31	1929-30	1930-31	1929-30	1929-30	1929-30
<i>Exporting Countries:</i>										
United States	1,433	972	46	20	36,391	25,929	538	1,889	—	—
Argentina	73	90	—	—	439	597	—	—	—	—
Brazil	—	—	—	—	(2) 505 (2)	1,334	—	—	—	—
India	836	1,019	132	112	14,645	15,172	1,845	800	—	—
Egypt	—	—	—	—	(2) 5,359 (2)	6,188 (2)	0 (2)	0	—	—
<i>Importing Countries:</i>										
Germany	152	163	562	435	1,706	1,885	8,442	8,944	—	—
Austria	0	0	33	40	0	2	467	562	—	—
Belgium	26	9	139	134	201	106	1,713	2,030	—	—
Denmark	—	—	11	0	—	—	154	146	—	—
Spain	2	2	220	196	24	44	2,233	3,207	—	—
Estonia	0	0	7	7	0	0	84	130	—	—
Finland	0	0	11	13	0	2	172	143	—	—
France	53	34	269	408	549	668	8,142	8,272	—	—
Gr. Brit. and N. Irel.	53	49	542	410	481	769	10,959	13,181	—	—
Greece	0	0	37	2	0	2	225	68	—	—
Hungary	—	—	22	24	—	—	291	291	—	—
Italy	0	0	300	260	2	9	3,821	5,150	—	—
Latvia	0	0	2	4	0	0	62	77	—	—
Norway	—	—	0	2	—	—	46	46	—	—
Netherlands	0	0	82	68	7	7	1,043	1,027	—	—
Poland	2	0	95	106	24	26	1,444	1,215	—	—
Portugal	—	—	29	22	—	—	333	401	—	—
Sweden	—	—	49	42	—	—	467	516	—	—
Switzerland	7	0	46	29	7	0	603	639	—	—
Czechoslovakia . .	11	13	168	159	154	170	2,363	2,701	—	—
Yugoslavia	0	0	15	15	0	0	183	198	—	—
Canada	—	—	44	49	—	—	1,025	1,043	—	—
Japan	64	77	767	450	534	417	13,757	13,082	—	—
Algeria	—	—	—	—	(3) 11 (3)	24 (3)	2 (3)	2	—	—
Totals	2,712	2,483	3,628	3,068	61,679	63,351	60,446	64,560		

Wool. — (Thousand lbs).

Exporting Countries:		ELEVEN MONTHS (September 1-July 31)										Twelve months (Sept. 1-August 31)	
Spain	227	547	855	809	3,675	7,249	9,546	5,143	8,062	5,761			
Irish Free State	...	...	...	...	(2)	5,571 (2)	8,173 (2)	633 (2)	833	10,249	894	
Hungary	2,363	2,211	88	137	6,288	8,146	1,561	1,359	10,013	1,561			
Argentina	a) 9,947	17,070	—	—	320,705	268,632	—	—	277,391	—			
b) 245	—	245	—	—	—	5,776	—	—	6,206	—			
Chile	...	...	...	...	(2)	39,412 (2)	18,766	—	20,318	—		
India	2,141	5,199	812	538	35,805	45,689	4,387	3,964	47,825	4,189			
Syria and Lebanon	...	...	...	...	(2)	9,035 (2)	6,561 (2)	2,756 (2)	999	7,485	1,810	
Algeria	...	...	...	...	(3)	10,715 (3)	6,023 (3)	573 (3)	969	14,897	1,975	
Egypt	...	...	...	...	(2)	2,800 (2)	2,266 (2)	2 (2)	2	2,538	2	
Tunis	86	88	157	146	437	545	761	955	551	1,113			
Un. of S Africa	a) ...	...	...	...	(1)	261,897 (1)	272,651 (1)	88 (1)	0	288,877	0	
b) ...	...	...	...	...	(1)	4,030 (1)	5,754 (1)	476 (1)	236	7,401	298	
Australia	a) 34,295	54,589	421	90	738,646	729,755	2,326	2,778	738,152	2,837			
b) 4,881	5,933	0	0	0	41,462	44,353	53	644	47,375	604			
New Zealand	a) 2,538	8,675	0	2	171,059	154,814	0	18	156,771	13			
b) 5,443	8,770	0	0	0	40,695	40,388	0	9	48,473	7			
Importing Countries:													
a) 1,343	461	23,949	29,635	9,711	10,675	313,512	266,384	11,188	204,117				
Germany	b) 1,386	1,016	2,434	2,984	11,760	13,872	26,350	26,397	14,966	23,603			
Austria	2	26	1,925	538	236	353	13,838	13,966	266	15,655			
Belgium	a) 840	725	12,145	15,904	9,145	8,371	128,861	165,876	9,006	168,983			
b) 1,737	1,834	157	381	19,906	24,337	3,563	4,511	25,946	4,961				
Denmark	11	4	357	201	84	119	3,254	3,276	130	3,443			
Finland	20	0	146	218	73	84	2,285	1,738	86	1,929			
France	4,037	3,574	33,014	57,986	43,416	52,060	456,023	437,334	55,931	563,225			
Gr. Britain and N. Ir.	25,278	20,381	43,537	49,222	293,043	311,962	861,978	740,677	333,774	713,227			
Greece	11	168	233	338	315	578	2,762	2,843	659	2,753			
Italy	a) 207	152	5,509	6,519	2,004	1,916	91,514	87,945	1,280	95,925			
b) 511	172	635	597	4,343	2,513	5,465	12,330	2,655	13,512				
Norway	42	57	130	143	631	911	1,510	1,742	993	1,761			
Netherlands	a) 273	216	229	306	2,292	1,922	8,430	10,060	2,112	9,761			
b) 18	24	505	520	353	455	5,780	5,780	567	5,780				
Poland	190	229	2,636	4,256	2,405	3,197	36,099	32,218	3,383				
Sweden	—	—	1,166	1,349	—	—	13,993	14,890	—	—			
Switzerland	29	0	1,380	1,420	324	55	17,933	14,251	85				
Czechoslovakia	117	0	2,274	2,306	1,429	2,024	34,383	35,893	2,223				
Yugoslavia	0	24	229	644	24	44	7,632	5,225	59				
Canada	251	494	692	814	1,594	4,394	13,171	6,433	6,199	2,778			
United States	150	206	12,987	8,900	1,916	2,114	143,890	195,096	2,223	203,581			
Japan	0	0	24,235	18,012	42	24	137,228	91,393	24	100,990			
Totals	98,514	133,253	174,772	203,413	2,168,199	2,463,526	2,296,363	2,296,363	2,162,127	2,421,433			

a) = Wood, greasy; b) = Wool, scoured.

(7) (a) (3) See notes page 567.

COUNTRIES	JULY		TWELVE MONTHS (July 1-June 30)		TWELVE MONTHS (July 1- June 30)	COUNTRIES	JULY		TWELVE MONTHS (July 1-June 30)		TWELVE MONTHS (July 1- June 30)
	1931	1930	1930-31	1929-30	1929-30		1931	1930	1930-31	1929-30	1929-30
Coffee. (Thousand lbs)						Tea. (Thousand lbs)					
EXPORTS.						EXPORTS.					
<i>Exporting Countries:</i>						<i>Exporting Countries:</i>					
Brazil			2,317,260	1,995,234	—	Ceylon	20,770	23,585	247,307	251,286	—
India	1,340	3,812	23,488	31,667	—	India	30,159	42,953	347,399	370,146	—
Java and Madura .			38,105	55,649	—	Java and Madura .			168,936	154,582	—
						Japan	2,809	3,825	24,315	24,835	—
<i>Importing Countries:</i>						<i>Importing Countries:</i>					
Germany	381	31	1,845	470	—	Belgium	2	2	31	26	—
Belgium	714	104	5,000	1,041	—	Irish Free State .			185	194	—
France	2	2	60	22	—	France	4	4	35	57	—
Netherlands	1,069	1,365	13,243	21,208	—	Gr. Brit. and N. Ir.	7,476	7,760	87,052	95,771	—
Portugal	15	46	553	571	—	Netherlands	11	7	115	53	—
Switzerland	73	26	399	227	—	United States	24	26	486	631	—
Canada	7	4	55	79	—	Syria and Lebanon .			18	20	—
United States	1,510	1,596	24,321	17,306	—	Algeria		(3)	20 (3)	18	—
Ceylon	2	53	227	719	—	Union of S. Africa .		(2)	62 (2)	71	—
Syria and Lebanon .			62	82	—	Australia	40	70	858	1,702	—
Australia	7	7	53	82	—	New Zealand			115	97	—
Totals	—	—	2,429,361	2,124,417	—	Totals	61,295	78,241	867,009	899,498	—
IMPORTS.						IMPORTS.					
<i>Importing Countries:</i>						<i>Importing Countries:</i>					
Germany	25,574	39,295	350,362	313,803	—	Germany	922	1,812	12,741	12,807	—
Austria	1,709	1,623	23,268	20,064	—	Austria	174	51	1,400	1,228	—
Belgium	11,292	7,494	123,457	94,662	—	Belgium	46	46	689	617	—
Bulgaria	180	115	1,660	1,735	—	Denmark	99	88	1,296	1,195	—
Denmark	6,878	4,534	63,224	58,531	—	Spain	44	20	282	317	—
Spain	3,878	5,267	53,363	54,798	—	Estonia	4	4	146	148	—
Estonia	15	22	309	293	—	Irish Free State . .			24,346	23,310	—
Irish Free State . . .			525	463	—	Finland	20	18	260	278	—
Finland	3,122	3,155	40,442	33,614	—	France	185	207	3,536	3,305	—
France	38,453	32,591	405,861	385,618	—	Gr. Britain and N.					—
Gr. Britain and N.					—	Ireland	43,279	39,004	541,616	558,856	—
Ireland	3,649	3,558	37,858	36,099	—	Greece	29	31	644	584	—
Greece	1,058	1,107	12,560	12,452	—	Hungary	53	31	650	714	—
Hungary	699	694	7,568	8,128	—	Italy	11	11	328	337	—
Italy	6,949	7,083	98,430	102,592	—	Latvia	11	9	168	209	—
Latvia	22	31	353	235	—	Lithuania	18	20	179	174	—
Lithuania	31	37	478	428	—	Norway	22	35	388	375	—
Norway	4,343	2,500	37,690	34,335	—	Netherlands	2,657	2,588	32,512	29,866	—
Netherlands	8,523	7,042	100,483	93,936	—	Poland	355	851	4,614	4,434	—
Poland	1,700	1,329	17,589	17,668	—	Portugal	66	51	597	686	—
Portugal	1,105	895	11,413	9,978	—	Rumania		(5)	725 (5)	866	—
Rumania		(5)	6,770 (5)	6,887	—	Sweden	51	40	928	877	—
Sweden	9,165	8,490	100,829	99,162	—	Switzerland	152	130	1,731	1,567	—
Switzerland	3,402	3,026	31,808	31,017	—	Czechoslovakia . . .	82	77	1,473	1,396	—
Czechoslovakia . . .	2,443	3,750	29,026	31,458	—	Yugoslavia	37	44	628	776	—
Yugoslavia	1,677	1,607	20,862	21,713	—	Canada	1,151	3,272	43,147	46,767	—
Canada	2,364	2,769	33,669	26,861	—	United States	6,579	7,006	87,151	86,369	—
United States	145,265	108,672	1,728,578	1,565,080	—	Chile			5,362	5,121	—
China			10,737	12,597	—	Syria and Lebanon .			351	315	—
India	445	203	3,148	3,150	—	Turkey	150	110	2,138	2,080	—
Java and Madura . .	474	833	4,478	4,004	—	Algeria		(3)	2,460 (3)	2,141	—
Syria and Lebanon . .			2,732	2,504	—	Egypt			13,616	14,978	—
			12,858	12,577	—	Tunis	1,603	260	2,952	3,144	—
			(3) 25,576 (3)	22,001	—	Union of S. Africa .		(2)	12,670 (2)	10,187	—
			14,548	27,661	—	Australia	3,309	4,963	46,438	50,784	—
			3,086	3,470	—	New Zealand			14,405	12,461	—
			(1) 28,226 (1)	28,122	—						—
			2,619	4,253	—						—
			430	514	—						—
<i>Exporting Countries:</i>						<i>Exporting Countries:</i>					
India			4,080	6,558	—	India	997	401	6,282	6,828	—
Java and Madura . .					—	Java and Madura . .			11,880	14,917	—
Totals	264,216	244,345	3,421,135	3,136,331	—	Totals	61,598	60,689	886,586	897,908	—

COUNTRIES	JULY		TEN MONTHS (Oct. 1-July 31)		TWELVE MONTHS (Oct. 1-Sept. 30)	COUNTRIES	JULY		TWELVE MONTHS (August 1-July 31)		TWELVE MONTHS (August 1-July 31)
	1931	1930	1930-31	1929-30	1929-30		1931	1930	1930-31	1929-30	1929-1930
Cacao. (Thousand lbs.)						Total Wheat and Flour (*) (Thousand centals).					
EXPORTS.						a) NET EXPORTS					
<i>Exporting Countries:</i>						<i>Exporting Countries:</i>					
Grenada			(2) 7,780	(2) 8,256	9,074	Bulgaria	531	20	3,527	(6)	—
Dominican Republ.	13,620	8,382	(2) 48,707	40,838	42,560	Spain	(6)	9	104	(6)	—
Brazil			(2) 95,698	(2) 127,112	162,486	France	(6)	2,810	(6)	(6)	—
Ecuador			(2) 31,270	(2) 38,801	39,899	Hungary	115	399	10,501	17,494	—
Trinidad			(2) 58,476	(2) 45,268	51,492	Lithuania	4	9	567	62	—
Venezuela			(2) 28,204	(2) 22,798	38,773	Poland	154	(6)	2,588	117	—
Ceylon	635	556	(1) 7,791	(2) 7,410	8,446	Rumania	258	185	9,008	1,433	—
Java and Madura			(2) 1,587	(2) 1,144	2,833	U. S. S. R.			(1)(8) 64,164	(1)(8) 4,165	—
Cameroon			(1) 22,049	(1) 20,410	24,654	Yugoslavia	408	236	8,362	13,769	—
Ivory Coast			(1) 42,739	(1) 40,519	47,638	Canada	8,406	13,627	154,489	110,381	—
Gold Coast	14,154	39,994	466,621	468,184	507,508	United States	9,270	8,827	65,621	83,055	—
Nigeria	3,278	6,515	116,608	115,776	116,634	Argentina	3,761	2,385	73,553	90,361	—
St. Thomas and Prince	1,967	1,761	22,057	29,172	32,880	Chile			(2) 500	(2) 595	—
Togoland			(1) 11,585	(1) 13,647	14,357	British India	(6)	1,413	(6)	248	—
						Turkey	13	7	282	(6)	—
						Algeria			(3) 5,038	(3) 2,072	—
						Tunis	959	611	3,431	3,408	—
						Australia	7,392	2,524	90,379	36,689	—
						Totals	31,384	32,553	487,310	363,854	—
<i>Importing Countries:</i>						b) NET IMPORTS.					
Germany	0	0	432	216	216	Germany	2,648	1,975	18,689	23,744	—
Belgium	46	18	558	223	304	Austria	1,510	1,202	9,345	11,368	—
France	0	0	223	37	37	Belgium	3,243	2,302	28,024	25,402	—
Netherlands	542	392	9,328	9,608	10,070	Bulgaria	(7)	(7)	(7)	855	—
Poland	0	0	13	13	13	Denmark	534	410	6,905	4,650	—
Czechoslovakia	0	0	18	20	20	Spain	(7)	33	71	485	—
United States	873	584	7,194	7,319	8,955	Estonia			(2) 10,331	(2) 9,464	—
Australia	4	29	66	245	276	Irish Free State			2,956	3,320	—
Totals	35,119	58,226	974,246	991,325	1,122,563	Finland	238	276	36,565	6,574	—
						France	7,112	(7)	14,258	11,583	—
						Gr. Brit. and N. Ir.	14,258	11,583	184,811	122,918	—
						Greece	1,076	1,065	14,454	12,996	—
						Italy	1,892	3,278	48,222	25,402	—
						Latvia	51	192	924	1,470	—
						Norway	386	902	4,905	4,048	—
						Netherlands	1,444	1,667	20,900	18,100	—
						Poland	(7)	55	(7)	(7)	—
						Portugal	311	902	1,607	3,985	—
						Sweden	154	470	2,989	4,565	—
						Switzerland	(8) 1,019	(8) 959	(8) 11,094	(8) 9,500	—
						Czechoslovakia	721	507	10,302	7,928	—
						Ceylon	53	60	697	575	—
						India	309	(7)	3,019	(7)	—
						Indochina			(2) 546	(2) 644	—
						Java and Madura			(2) 12,010	(2) 1,408	—
						Syria and Lebanon			(2) 82	(2) 673	—
						Turkey	(7)	(7)	17	663	—
						Egypt			(1) 8,289	(1) 6,556	—
						Union of South Afr.			(1) 1,724	(1) 2,133	—
						New Zealand			(1) 586	(1) 243	—
						Totals	31,384	32,553	487,310	363,854	—

(*) Flour reduced to grain on the basis of the coefficient; 1,000 centals of flour = 1,333.33 centals of grain.

(a) Excess of exports over imports. — (b) Excess of imports over exports.

(1) Data up to 31st May. — (2) Data up to 30th June. — (3) Data up to 30th April. — (4) Data up to 31st March. — (5) Data up to 28th February. — (6) See Net Imports. — (7) See Net Exports. — (8) Wheat only.

STOCKS

QUANTITIES OF CEREALS ON OCEAN PASSAGE WITH FIRST DESTINATION FOR EUROPE.

SPECIFICATION	Saturday nearest to 1st of month					Saturday nearest to 1st of month				
	Septem., 1931	August, 1931	July, 1931	Septem., 1930	Septem., 1929	Septem., 1929	August, 1931	July, 1931	Septem., 1930	Septem., 1929
	1,000 centals					1,000 bushels				
Wheat (and flour in terms of wheat)	23,147	22,738	20,890	23,632	27,902	46,912	37,896	49,316	47,720	46,504
Rye	667	403	730	211	446	1,191	729	1,303	877	797
Barley	3,544	2,184	3,680	5,044	3,948	7,333	4,550	7,667	10,508	8,225
Oats	1,274	1,402	1,398	970	547	3,850	4,380	5,930	3,030	1,710
Maize	23,506	26,626	25,877	18,082	18,187	41,974	47,546	46,209	32,289	32,477

Authority: *Broomhall's Corn Trade News.*

COMMERCIAL CEREALS IN STORE IN CANADA AND THE UNITED STATES.

SPECIFICATION	Friday or Saturday nearest to 1st of month					Friday or Saturday nearest to 1st of month				
	Septem., 1931	August, 1931	July, 1931	Septem., 1930	Septem., 1929	Septem., 1931	August, 1931	July, 1931	Septem., 1930	Septem., 1929
	1,000 centals					1,000 bushels				
WHEAT:										
Canadian in Canada . . .	59,654	63,119	64,716	50,572	48,809	99,478	105,199	107,860	84,237	81,348
U. S. in Canada	19,342	13,700	9,208	2,237	2,681	32,236	22,934	15,847	8,812	4,496
U. S. in the United States .	156,713	139,449	122,505	120,792	112,108	261,189	232,415	204,175	201,319	196,847
Canad. in the United States .	8,977	3,746	3,613	7,562	13,215	6,623	6,243	6,021	12,603	22,025
Total	239,716	220,074	200,042	181,213	176,913	399,526	366,791	333,403	302,021	291,876
RYE:										
Canadian in Canada . . .	6,862	6,774	7,024	4,733	2,230	12,254	12,097	12,542	8,541	3,962
U. S. in Canada	994	1,004	928	1,922	862	1,775	1,792	1,657	3,432	1,540
U. S. in the United States .	5,267	5,509	5,687	7,979	4,794	9,406	9,337	10,155	14,248	8,561
Canad. in the United States .	1	1	1	96	242	2	2	2	172	432
Total	13,124	13,288	13,640	14,730	8,128	23,437	23,728	24,356	26,393	11,515
BARLEY:										
Canadian in Canada . . .	3,537	4,872	5,356	9,617	3,977	7,363	10,151	11,158	20,085	8,285
U. S. in Canada	12	22	22	318	119	24	45	45	652	247
U. S. in the United States .	3,404	3,152	3,277	5,253	6,189	7,092	6,567	6,827	10,946	12,894
Canad. in the United States .	1	57	78	624	821	3	119	168	1,300	1,711
Total	6,954	8,103	8,733	15,807	11,106	14,487	16,832	18,193	32,932	23,136
OATS: (1)										
Canadian in Canada	2,580	2,959	3,085	2,031	5,052	8,061	8,704	9,074	6,348	15,788
U. S. in Canada	37	70	165	911	632	117	207	484	2,846	2,132
U. S. in the United States .	4,618	2,565	2,416	8,270	7,732	15,032	8,017	7,550	25,844	24,318
Canad. in the United States .	13	4	18	7	109	41	13	55	21	341
Total	7,448	5,598	5,684	11,219	13,625	23,251	16,941	17,163	35,069	42,579
MAIZE:										
U. S. in Canada	312	109	99	82	260	557	195	176	148	480
others origin in Canada . .	160	259	282	407	108	285	463	467	723	193
U. S. in the United States .	5,076	4,682	4,602	2,363	3,550	9,064	8,361	8,217	4,220	6,340
Total	5,548	5,050	4,983	2,852	3,927	9,906	9,019	8,860	5,094	7,013

(1) All oats expressed in bushels of 32 lbs.

GRAIN AND FLOUR STOCKS AT THE PORTS OF GREAT BRITAIN AND IRELAND (1).

PRODUCERS	First of the month					First of the month				
	Septem., 1931	August, 1931	July, 1931	Septem., 1930	Septem., 1929	Septem., 1931	August, 1931	July, 1931	Septem., 1930	Septem., 1929
	1000 centals					1000 bushels				
WHEAT										
Grain	7,392	5,640	3,360	2,832	2,712	12,320	9,400	5,600	4,720	4,520
Flour as grain . .	672	744	624	792	576	1,120	1,240	1,040	1,320	960
TOTAL	8,064	6,384	3,984	3,624	3,288	13,440	10,640	6,640	6,040	5,480
Barley	420	610	600	500	840	875	1,333	1,250	1,042	1,750
Oats	672	784	528	432	736	2,100	4,250	1,650	1,850	2,300
Maize	2,640	1,536	1,584	1,152	1,896	4,714	2,743	2,829	2,057	3,386

Authority: *Broomhall's Corn Trade News*.

(1) Imported cereals

STOCKS OF COTTON ON HAND IN THE UNITED STATES

LOCATION	Last day of the month					Last day of the month				
	August, 1931	July, 1931	June, 1931	August, 1930	August, 1929	August, 1931	July, 1931	June, 1931	August, 1930	August, 1929
	1000 centals					1000 bales (counting round as half bales)				
In consuming establishments	4,010	4,761	5,411	4,922	3,898	840	995	1,131	1,012	801
In public storage and at compresses	21,178	21,647	23,786	16,885	6,732	4,426	4,524	4,971	3,465	1,332
TOTAL	25,197	26,408	29,197	21,807	10,630	5,266	5,519	6,102	4,477	2,133

STOCKS OF COTTON IN EUROPE.

COUNTRIES, PORTS, DESCRIPTIONS	Thursday or Friday nearest to 1st of month					Thursday or Friday nearest to 1st of month				
	Septem., 1931	August, 1931	July, 1931	Septem., 1930	Septem., 1929	Septem., 1931	August, 1931	July, 1931	Septem., 1930	Septem., 1929
	1000 centals					1000 bales (1 bale = 478 lbs.)				
Great Britain:										
American	1,691	2,033	2,286	1,186	1,704	354	425	478	248	357
Argentine, Brazilian, etc.	226	195	191	334	235	47	41	40	80	49
Peruvian, etc. . . .	272	229	224	339	299	57	48	47	71	62
East Indian, etc. . .	683	745	800	284	233	143	156	168	60	49
Egyptian, Sudanese	1,334	1,304	1,368	1,340	1,246	279	273	286	280	261
Other (1)	253	233	244	291	375	53	49	51	61	78
TOTAL	4,459	4,739	5,113	3,524	4,092	933	992	1,070	800	856
Bremen										
American	1,318	1,626	1,856	856	893	276	341	388	179	187
Other	31	67	61	64	30	17	14	13	13	6
TOTAL	1,399	1,695	1,917	920	923	293	355	401	192	193
Le Havre:										
American	1,031	1,225	1,360	399	354	217	256	285	84	74
Other	196	167	178	201	141	41	35	37	42	30
TOTAL	1,235	1,392	1,538	600	495	258	291	322	126	104
Total Continent (2):										
American	2,687	3,303	3,800	1,451	1,422	562	691	795	303	297
Argentine, Brazilian, etc.	108	105	106	76	73	23	22	22	10	15
E. Indian, Australian, etc.	202	206	228	281	134	42	43	48	59	28
Egyptian	112	77	99	79	65	23	16	21	17	14
W. Indian, E. African, etc.	56	44	57	134	99	12	9	12	23	21
TOTAL	3,165	3,735	4,290	2,021	1,793	662	781	893	423	375

Authority: *Liverpool Cotton Ass.*

(1) Includes: W. Indian, etc.; E. African, etc.; W. African, and Australian. — (2) Includes Bremen, Havre, and other Continental ports.

STOCKS OF COTTON AT BOMBAY AND AT ALEXANDRIA

PORTS	Thursday nearest to 1st of month					Thursday nearest to 1st of month				
	Sept., 1931	August, 1931	July, 1931	Sept., 1930	Sept., 1929	Sept., 1931	August, 1931	July, 1931	Sept., 1930	Sept., 1929
	1000 centals					1000 bales (1 bale = 478 lbs.)				
Bombay (1)	2,160	2,805	3,439	2,816	3,428	452	587	719	589	717
Alexandria	4,029	4,414	4,671	3,422	1,257	848	923	977	716	263

Authorities: *East Indian Cotton Ass.* and *Alexandria General Produce Ass.*
 (1) Stocks held by exporters, dealers and mills.

IMPORT DUTIES ON CEREALS AND FLOUR

CHANGES

TO BE MADE IN THE DUTIES PUBLISHED ON PAGE 425 OF THE CROP REPORT OF JULY, 1931.

COUNTRY	PRODUCT	Date when enforced	Original data per metric quintal	Data in Amer. cents per barrel or barrel
Germany	Wheat (1)	August, 24	R. M. 2.00	(2.97
"	Rye (1)	"	" 1.00	6.00)
Italy	Maize, other than white	September, 2	lites 30.00	10.00
Czechoslovakia	Wheat, rye, barley, oats, maize, cereal flour	July, 26	(2)	(2)
"	Wheat	September, 9	Cz. ct. 55.00	44.37
"	Rye	"	" 57.00	42.39
"	Barley	"	" 70.00	45.16
"	Oats	"	" 43.00	18.49
"	Flour of wheat and of rye	"	" 117.00	308.26
Yugoslavia	Wheat, rye, wheat flour	September, 5	(3)	(3)

(1) Provided that proof is given by the production of an export bond (*Ausfuhrschein*) that a corresponding quantity of the same cereal has been exported during the period ended December 31, 1931. — (2) Fee of 1% *ad valorem* for all licences granted in respect of importation. — (3) Imported exclusively by the Monopoly.

MONTHLY REVIEW OF PRICES (1)

PRODUCTS, MARKETS AND DESCRIPTIONS	Sept. 18, 1931	Sept 11, 1931	Sept. 4, 1931	August 28, 1931	August 21, 1931	Average (2)			Commercial Season	
						August 1931	Sept 1930	Sept 1929	1930-31	1929-30
WHEAT.										
Budapest (a) Tisza region (75-80 kg. p. hl., pengo p. 100 kg.)	9.60	9 10	8.72	9 32	9.60	9.67	15 94	22 50	15 08	22 94
Braila : Home grown (79-80 kg. p. hl., lei p. 100 kg.)	280	275	285	270	280	282	407	701	351	612
Winnipeg : No. 1 Manitoba (cents p. 60 lbs.)	52 ½	54 ¾	53 ¼	55 ⅞	57 ¼	55 ⅞	78	149 ⅞	64 ¼	124 ⅞
Chicago : No. 2 Hard Winter (3) (cents p. 60 lbs.)	n. 52 ¼	n. 50 ¼	49 ⅞	n. 50 ¼	51	51	88 ½	130 ¼	78	114 ⅞
Minneapolis : No. 1 Northern (cents p. 60 lbs.)	68 ⅞	70 ½	65	65	68 ⅞	63 ¼	84 ¾	133 ¾	77 ⅞	117 ½
New York : No. 2 Hard Winter (3) (cents p. 60 lbs.)	64 ¼	63 ¼	61	60 ¼	61 ⅞	61 ½	91 ⅞	137 ¼	n. 91 ⅞	121 ⅞
Buenos Aires (a); Barlette (80 kg p. hectol. — pesos paper per quintal)	5 95	5.80	5.75	5.80	5.85	5.75	8.97	10.68	6.88	10.65
Karachi : Karachi white, 2 ½ % barley, 1 ½ % dirt (rupees per 556 lbs.)	16-10-0	17-2-0	17-10-0	17-6-0	17-2-0	17-8-6	28-12-0	41-8-6	19-15-2	36-6-9
Berlin : Home grown (Reichsmarks p. quintal)	21.15	21.90	21.00	21.50	22.20	21.07	23 92	22.66	20 00	25 83
Hamburg, c. i. f. (Reichsmarks p. quintal):										
No. 3 Manitoba	(4)10.62	(4)10 54	(4)10 62	(5)10 45	(5)10.71	(5)10 60	14.45	25 14	—	21.30
No. 2 Hardwinter	8.58	8.75	8.33	8.58	8.84	8 58	14.44	21.67	n. 13 00	19.49
Barusso (79 kg p. hectol.)	8.11	8 41	8 24	8 41	8 41	8 25	(6)14 49	20.44	11.21	18.72
Antwerp (Belgian francs p. quintal):										
Home grown	...	91	92	97	96	97	n.102 ½	160 ½	95 ½	154 ¼
No. 2 Hard Winter, Gulf	...	70	72	74	72 ½	78	127	188 ½	112 ½	171
Paris : Home grown, 75-77 kg. (francs p. quintal)	167 00	166.75	166.75	168 00	167.00	162.45	171 55	147.20	175.00	189.40
London : Home grown (shillings per 504 lbs.)	(7)20/-	(7)19/6	(7)19/-	25/6	27/-	27/-	30/4	48/-	27/1	40/10
London and Liverpool c. i. f., shipping current month (shillings p. 480 lbs.)										
South Russian (on sample)	17/-	17/4 ½	17/4 ½	17/3	17/10 ½	-17/7	29/10	n. q.	28/7	n. q.
No. 3 Manitoba	19/-	18/9	19/1 ½	19/7 ½	20/4 ½	19/9	30/7	53/2	25/4	45/2
No. 2 Hard Winter (3)	n. 18/6	18/3	18/1 ½	18/11	19/6	19/-	30/10	46/1	26/4	41/5
White Pacific	20/6	19/6	19/-	19/3	19/3	19/2	30/10	46/4	26/7	42/3
Rosafe (63 ½ lbs.), afloat	(8)17/6	(8)16/6	(8)16/9	(8)18/-	(8)18/-	(8)18/-	(9)30/11	44/4	28/5	40/3
Choice White Karachi	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	31/1	47/10	27/-	42/2
Australian	10)19/6	(10)19/-	(10)19/-	(10)19/6	(10)19/-	(10)19/6	31/7	47/9	25/7	43/6
Milan (b) : Home grown, soft (liras p. quintal)	94.00	95.00	94.00	92 00	88.50	88.80	124.50	123.00	109.10	131.30
Genoa c. i. f. (shillings p. metric ton). La Plata.	n. q.	n. q.	n. q.	90/6	90/6	90/6	137/6	104/-	110/-	184/6
RYE.										
Budapest (a) Home grown (pengo p. 100 kg.)	9 15	8 90	8.55	9.02	8.72	8.61	8.68	16 04	10 60	18.44
Berlin : Home grown (Reichsmarks per quintal)	18.35	18.00	17.20	17.10	16.70	16.34	17.27	18.51	17.23	17 04
Hamburg c. i. f. : La Plata, 74-75 kg. (R. M. p. 100 kg.)	n. q.	n. q.	n. q.	n. q.	n. q.	n. 6.71	n. q.	17.51	n. 7 65	14.57
Minneapolis : No. 2 (cents per 56 lbs.)	41	40	37	39	39 ½	39 ⅞	53	98 ⅞	42 ⅞	80 ⅞
Groningen (c) : Home grown (florins per quintal)	4.57	4.62	4.67	4.62	4.25	4.34	4.75	8.10	4 45	6 83
BARLEY.										
Braila : Home grown (62-63 kg p. hl., lei p. 100 kg.)	190	195	185	225	215	214	215	(11)412	232	304
Winnipeg : No. 4 Western (cents p. 48 lbs.)	28 ½	29 ½	29 ⅞	30 ⅞	30 ⅞	29 ¾	28 ½	69 ⅞	26 ⅞	51 ⅞
Chicago : Feeding (cents per 48 lbs.)	40	39	45	41	44	41 ¼	50	62 ½	43 ⅞	57 ⅞
Berlin Home-grown fodder (Reichsmarks per quintal)	15.25	15.60	15 65	15.90	15.70	15.47	18.86	18.81	19.52	17.40
Antwerp : Danube (francs per quintal)	—	72	75	73	68	70	75 ½	138 ½	79 ½	107 ½
London : English malting (shillings p. 448 pounds)	40/-	(7)40/-	(7)40/-	(7)40/-	n. q.	(7)40/-	35/-	44/-	35/8	39/-
London and Liverpool, c. i. f., parcels (shillings per 400 lbs.)										
Danubian 3 %	13/3	13/-	18/6	14/6	n. 15/6	14/7	14/6	27/11	15/2	22/3
Russian (Azoff-Black sea)	n. q.	12/9	13/9	14/6	14/3	14/2	14/7	n. q.	14/3	18/11
Canadian Western, No. 3 (a)	15/6	15/-	15/6	15/9	15/-	15/3	16/7 ½	n. 32/3	15/11	27/-
Californian malting (shillings p. 448 lbs.)	30/-	30/-	30/-	30/-	30/-	30/4	28/4	35/10	27/3	32/6
Groningen (c) : Home grown winter (fl. p. quintal)	5.00	5.00	5.07	5.10	5.12	5.25	5.12	8.28	4.97	7.55

(2) Thursday prices. — (b) Saturday prices. — (c) Prices of preceding Tuesday.

(1) All quotations are, unless otherwise stated, for spots — (2) The monthly averages are based on Friday quotations, the annual averages on the monthly. — (3) Quoted formerly as No. 2 Winter. — (4) No. 1 Manitoba. — (5) No. 2 Manitoba — (6) 78 kg. p. hl. — (7) New harvest. — (8) 63 lbs. per bushel. — (9) 62 ½ lbs. per bushel. — (10) South Australian. — (11) 64 kg. p. hl. — (12) In Hen of Western No. 4.

PRODUCTS, MARKETS AND DESCRIPTION	Sept	Sept.	Sept.	August	August	Average (1)				
	18,	11,	4,	28,	27,	August	Sept.	Sept.	Commercial	
	1931	1931	1931	1931	1931					
						1931	1930	1929	Season	
									1930-31	1929-30
OATS										
Braila: Home grown (43-44 kg. p. hl; let p. 100 kg.)	235	235	215	215	240	231	206	345	247	256
Winnipeg: No. 2 White (cents per 34 lbs)	27 1/4	27 1/4	27 1/4	27 1/4	28 1/4	28 1/4	33	68 1/2	30	58 1/4
Chicago: No. 2 White (cents per 32 lbs.)	24 1/4	23 1/4	24 1/4	23 1/2	24 1/2	23 1/4	38 1/2	50 1/2	32 1/2	44 1/2
Buenos Aires (a): Current quality (pesos paper per quintal)	4 80	4 40	4 35	4 50	4 10	4 14	3 80	6 96	3 58	5 30
Berlin: Home grown (Reichsmarks per quintal)	13 60	13 95	13 65	14 40	15 15	14 62	16 61	17 11	16 17	15 62
Paris: Home grown, black and other (francs per quintal)	85 75	87 25	83 50	92 00	88 75	83 45	82 00	100 45	81 00	81 15
London: Home grown white (shillings per 336 lbs.)	16/-	(2)15/6	(2)15/6	20/-	20/-	20/-	16/6	23/3	18/4	21/-
London and Liverpool c 1 f., parcels (shillings p 320 lbs.):										
Danubian (39-40 lbs.)	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	13/8	(3)21/4	n. 12/1	(3)n. 16/4
Plate (f. a. q.)	11/3	11/3	11/3	12/3	11/3	11/-	12/1	20/11	10/9	16/1
Chilian Tawny	n. q.	12/3	12/3	12/3	11/6	11/5	13/8	21/0	12/-	17/3
Milan (b): spot (liras per quintal):										
Home grown	69.00	69.00	69.00	68.00	66.00	66.50	79.85	84.00	73.05	80.75
Foreign imported	63.00	64 00	64 00	64.00	64.00	64.00	70 20	88 00	60.40	74.30
MAIZE										
Braila: Danube (let per quintal)	188	162	180	190	215	198	316	450	300	687
Chicago: No. 2 Mixed American (cents per 56 lbs)	45 1/4	44 1/4	45 1/4	45	44 1/4	49 1/4	94	101 7/8	85 1/2	94 1/4
Buenos Aires (a): Yellow Plate (pesos paper per quintal)	3.52	3 40	3.60	3.67	3.70	3.67	5.56	8 21	6.17	8 35
Antwerp, spot (Belgian francs per quintal):										
Bessarabian	..	66	68	69	68	69	98 1/2	n. q.	n. 97 1/4	n. q.
Cinquentino	...	56	59 1/2	60	61	62	120	153	131 1/4	173
Yellow Plate	..	52 1/2	53	56	55	55	96	141 1/2	140 1/2	155 1/4
London and Liverpool, parcels, c. 1. f. (shillings per 480 lbs.):										
Danube	n. q.	(4)18/3	(1)13/10 1/2	n. q.	n. q.	16/9	22/1	n. q.	24/11	n. q.
Yellow Plate	12/1 1/2	12/9	12/10 1/2	13/4 1/2	13/3	13/4	22/8	34/7	25/3	35/3
No. 2 White African	n. q.	18/-	18/3	18/3	17/9	17/10	22/3	36/-	26/-	35/8
Milan (b): Home grown (liras per quintal)	57.50	59.00	63.50	49 50	49.50	49.50	63.30	82.80	71.35	97.90
RICE (CLEANED).										
									1930	1929
Milan (b): Maratelli (lire per quintal)	95 00	95 00	95 00	95 00	94 00	96 10	128 35	178 75	152 15	195 70
Rangoon: No. 2 Burma (rupees per 7500 lbs)	270	280	285	295	280	287	406	512	393 1/4	462 1/4
Saigon (Indochinese piastres (5) p quintal):										
No. 1 Round white (25 % broken)	7.41	7 60	7 70	8 11	8 07	8 46	10 89	13 71	11 36	11 58
No. 2 Japan (40 % broken)	6 92	7 25	7 29	7 62	7 50	7 95	10 44	13 15	10 89	11 08
London (a): c. 1. f. (shillings per 112 lbs):										
Spanish Belloch, No. 3 oiled	10/6	9/10 1/2	10/4 1/2	10/7 1/2	10/7 1/2	10/8	13/3	17/1	14/1	17/11
Italian good, No. 6 oiled	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	18/4	14/11	18/0
American Blue Rose	18/6	17/1 1/2	17/6	17/6	17/6	17/7	20/5	23/6	27/9	21/10
Burma, No. 2	8 1/2	8 1/2	8 1/2	8 1/2	8 1/2	8/9	11/3	14/1	10/11	13/2
Saigon, No. 1	9/-	8/8	8/8	8 7/8	8/8	8/10	11/3	14/11	11/10	13/8
Siam, Garden, No. 1	9/-	9/-	9 1/4	9 1/2	9/6	9/8	14/5	n. q.	14/-	15/1
Tokio: Various qualities (yens per koku)	19.60	19.60	20.10	20.00	20.00	20.84	28.72	29 07	25.57	26.06
LINSEED.										
Buenos Aires (a): Current quality (pesos paper per quintal)	10.80	10.35	10.50	11.35	11.25	11.31	15.82	23.41	17 19	13.20
Antwerp: Plate (Belgian francs p. quintal)	...	131	140	143	146	146	257	377	284 1/4	318 1/4
Hull, c. i. f.: Plate (p. sterling p. 1. ton)	7-6-3	7-15-0	7-12-6	8-0-0	8-2-6	8-2-6	14 0-4	23-0-0	15-0-5	18-5-0
London, c. i. f.: Bombay bold (p. st. per long ton).	10-0-0	10-0-0	9-10-0	10-5-0	10-10-0	10-16-3	16-18-1	24-0-0	17-14-4	20-16-1
Duluth: No. 1, Northern (cents p. 56 lbs.)	132 1/2	136 1/4	134	140 1/4	141 1/2	141	189 1/4	327 1/4	236	273 1/4

(a) Thursday prices. — (b) Saturday prices.

(1) The monthly averages are based on Friday quotations, the annual averages on the monthly. — (a) New harvest. — (g) Weight indicated. — (4) Dan., Galatz-Foxonian; shipping October-November. — (5) Actual rate of change: 1 piastre = 38 1/2 sc.

PRODUCTS, MARKETS AND DESCRIPTION	Average (1)								
	Sept. 18, 1931	Sept 11, 1931	Sept. 4, 1931	August 28, 1931	August 21, 1931	August 1931	Sept 1930	Sept. 1929	Commercial Season
COTTONSEED									
Alexandria : Sakellandis (piastres per ardeb) . . .	(2) 45 7	(2) 44.5	(2) 45.0	(2) 47 3	42.2	42 3	59 4	102 1	67.9
Hull : Sakellandis (p. sterl. per long ton) . . .	4-16-3	4-18-0	5-2-6	5-2-6	4-18-3	4-15-7	5-15-7	10-17-6	6-18-2
									1929-30
									1928-29
COTTON.									
New Orleans : Middling (cents per lb.) . . .	6 08	6.44	6 42	6.85	6.44	6 99	10 61	13.48	10.07
New York : Middling (cents per lb.) . . .	6 40	6 75	6 70	7.15	6 65	7.19	10 99	13.89	10.38
Bombay : M. g. Broach f. g. (rupees per 784 lbs.) .	147	148	148	154	137	147 1/4	208	342 1/8	191 1/4
Alexandria (a) (talars per kantar) .									288 1/2
Sakellandis f. g. f.	10 72	10 32	9.92	10 87	9.62	10 84	21 1/8	33 1/8	17.12
Ashmouni (Upper Egypt) f. g. f.	8 10	7.85	7.75	8.20	7.20	7.88	13 1/2	21 1/16	12.00
Bremen : Middling (U S. cents per lb.) . . .	7.62	7.68	7.77	8 16	7.88	8.34	12.55	20.92	11.59
M. g. Broach fully good (pence per lb.) . . .	n. 3 25 n.	3.35 n.	3.40 n.	3 50 n.	3.35 n.	3.59 n.	4 71 n.	8.40 n.	4.63 n.
Le Havre : Middling, Gulf (francs per 50 kilogr.) .	222	229	228	225	218	235	364	628	349
Liverpool (pence per lb.) :									545
Middling fair	n. 4.94 n.	4.90 n.	4.91 n.	5.03 n.	4.90 n.	5.10 n.	7 56 n.	11.57 n.	6.93 n.
Middling	3 74	3.70	3.71	3 83	3.70	3 90	6.23	10.32	5.72
São Paulo, good fair	3.80	3.90	3.91	4 03	3 90	4.10	6.24	10.11	5.91
M. g. Broach, fully good	n. 3.09 n.	2.96 n.	2.96 n.	3.14 n.	3 00 n.	3.19 n.	4.22 n.	8 35 n.	4.25 n.
Sakellandis, fully good fair	6 00	5.60	5.60	5.95	5 70	5.90	10 80	17.21	9.08
									14.52
BUTTER									
Copenhagen (a) (Kr. p. 100 kg.)	212	212	200	200	218	201	246	326	245
Maastricht, auction (b) : Dutch (florins p. kg.) .	1.32	1 37	1.29	1.33	1 37	1.33	1.63	2.28	1.70
Hamburg, auction (b) : Schleswig-Holstein butter, with quality mark (R. M. per 50 kg.) . . .	183.43	183.12	128.00	133.81	139 15	132.50	146 85	193 88	146.67
Kempten (b) : Allgäu butter (Pfennige p. half kg.)	105	105	105	111	115	110	127	167	128
London (c) (shillings p. cwt.) .									159
British blended	140/-	140/-	140/-	140/-	140/-	140/-	154/-	186/8	158/8
Danish	132/-	128/-	130/-	136/-	128/-	126/6	153/8	191/6	153/6
Irish creamery, salted	120/-	120/-	121/-	121/-	121/-	119/6	135/6	181/6	134/10
Dutch	124/-	123/-	124/-	128/-	120/-	122/-	145/7	205/6	151/11
Argentine	116/-	117/-	118/-	118/-	116/-	116/-	130/-	174/-	135/10
Siberian	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	130/9	169/-	n. 133/10
Australian, salted	114/-	115/-	116/-	117/-	117/-	114/9	131/6	180/-	135/9
New Zealand, salted	117/-	117/-	118/-	122/-	121/-	119/3	133/-	185/6	137/8
									178/9
CHEESE.									
Milan (lire per quintal) :									
Parmigiano-Reggiano, 1st quality of last year's production	4/975	1,225	1,225	1,225	1,225	1,225	1,100	1,128	1,160
Green Gorgonzola, mature, choice	820	610	610	610	610	592	642	771	671
Rome : Roman pecorino choice (lire p. quintal) .	1,075	1,075	1,075	1,075	1,075	1,084	1,150	1,500	1,207
Alkmaar : Edam 40 + 40% butterfat, with the country's cheesemark, factory cheese, small : florins, p. 50 kg.)	35.00	34.00	35.00	37.00	37.00	37 75	40.37	47.87	40.88
Gouda (3) : Gouda 45 + (whole milk cheese, with the country's cheesemark, home made; florins, p. 50 kg.)	40.50	40.50	40.50	40 50	41.00	40.12	46.00	53.82	45.56
Kempten (b) : (Pfennige per half kg.) .									52.45
Softcheese, green (20 % butterfat)	28 1/2	28 1/2	28 1/2	28 1/2	28 1/2	28 1/2	33	40 1/2	27
Emmenthal from the Allgäu (whole milk cheese) 1st quality	98 1/2	98 1/2	100 1/2	100 1/2	100 1/2	100 1/2	(5) 94	(5) 105	(5) 97
London (c) (shillings per cwt.) :									107
English Cheddar	94/-	94/-	96/-	96/-	96/-	96/9	98/-	108/-	108/4
Canadian	63/-	64/-	65/-	65/6	65/-	66/1	81/8	97/10	98/11
New Zealand	64/6	64/6	66/6	65/-	65/-	66/3	78/1	96/10	82/2
Liverpool (c) : Engl. Cheshire, ungraded (sh. p. cwt.)	72/4	72/4	72/4	72/4	77/-	75/10	80/6	98/-	96/5
									111/9

(a) Thursday prices. — (b) Wednesday prices. — (c) Average prices for weeks ending on preceding Wednesday.

(1) The monthly averages are based on Friday quotations, the annual averages on the monthly. — (2) November delivery. —

(3) Indicated formerly as : Bodegraven. — (4) Produce of 1930 — (5) Average prices for all qualities.

THE PRICES OF AGRICULTURAL PRODUCTS IN AUGUST, 1931

In the following pages the index-numbers of prices of agricultural products and other price indices of interest to the farmer are given as published in the different countries. The indices collected together have been obtained according to different methods and criteria in the various countries. A detailed account of the items included in each series and the system of construction of the index-numbers may be found in the volume published especially for this purpose by the Institute, entitled « Index-numbers of prices of agricultural products and other price indices of interest to the farmer ». We refer the reader to this volume for an exact interpretation of the significance of the different series of data.

Owing to the substantial divergence which often exists in the value and significance of the indices available, much care is advisable in their utilization from an international point of view. For this reason it has been considered opportune to reproduce all the data in their original form only, without attempting to formally unite them. The latter process, by a comparison of often heterogeneous data, might easily lead to the drawing of erroneous relations and conclusions.

But in addition to the original data, and subject to the above comments, a summary table is given below.

Countries	Percentage variations in the index-numbers for August, 1931			
	compared with those for July, 1931		compared with those for August, 1930	
	Index-numbers of prices of agricultural products	General index-numbers of prices	Index-numbers of prices of agricultural products	General index-numbers of prices
Germany	— 1.9	— 1.3	— 11.3	— 11.6
England and Wales	0	— 1.4	— 10.4	— 14.2
Argentina	— 1.1	—	— 30.3	—
Canada	— 1.3	— 1.1	— 28.6	— 15.7
Estonia	—	—	—	—
United States a)	— 5.1	—	— 30.6	—
Finland b)	— 2.2	— 0.8	— 25.2	— 16.4
Hungary	— 1.4	— 1.2	— 15.7	— 9.0
Italy	— 4.6	— 3.2	+ 2.5	— 1.1
New Zealand	— 2.0	— 1.8	— 20.1	— 17.7
Netherlands	+ 0.4	—	— 23.6	—
Poland	— 2.9	—	— 19.3	—
Yugoslavia c)	— 0.8	— 1.6	— 14.5	— 15.3
	— 4.1	— 1.1	c) — 19.4	—
	d) + 1.2		d) — 21.8	— 18.1

a) "Bureau of Agricultural Economics". — b) "Bureau of Labor". — c) Products of the soil. — d) Animal products.

INDEX-NUMBERS OF PRICES OF AGRICULTURAL PRODUCTS AND OF COMMODITIES BOUGHT BY THE FARMER *

COUNTRIES AND CLASSIFICATION	August	July	June	May	April	March	August	August	Year	
	1931	1931	1931	1931	1931	1931	1930	1929	1930 (1)	1929
GERMANY										
(Statistisches Reichsamt)										
1913 = 100										
Foodstuffs of vegetable origin	114.6	126.1	129.8	131.8	129.7	121.0	124.0	120.6	115.3	126.8
Livestock	89.0	81.7	81.5	83.9	83.3	86.7	111.8	134.3	112.4	126.6
Livestock products	107.9	105.6	108.3	102.5	105.7	113.0	121.0	139.8	121.7	142.1
Feeding stuffs	98.3	104.7	114.5	120.0	113.9	102.7	100.4	123.1	98.2	125.9
Total agricultural products	103.4	105.4	107.3	109.2	108.3	106.7	116.6	132.6	113.1	130.2
Fertilizers	73.8	71.3	77.9	77.2	80.1	82.7	79.1	81.5	82.4	84.5
Agricultural dead stock	129.9	129.9	130.0	130.6	131.2	132.4	139.4	141.3	139.4	141.3
General index-number	110.2	111.7	112.3	113.3	113.7	113.9	124.7	133.1	124.6	137.2
ENGLAND AND WALES										
(Ministry of Agriculture)										
Average of corresponding months										
1911-13 = 100										
Agricultural products	121	121	123	122	123	123	135	152	134	144
Feeding stuffs	77	81	82	87	83	85	99	143	96	139
Fertilizers	95	100	100	100	100	100	99	98	101	100
General index-number (2).	93.1	94.4	97.2	96.7	99.3	100.6	103.5	134.0	114.1	135.3
ARGENTINA										
(Banco de la Nación argentina)										
1926 = 100.										
Cereals and linseed	53.7	55.1	54.5	54.3	51.2	53.2	87.2	104.9	82.3	100.4
Meat	94.4	92.5	93.8	93.8	93.7	94.2	118.0	116.5	110.9	113.6
Hides and skins	59.3	63.1	64.1	63.1	70.5	70.1	67.3	92.2	71.6	95.0
Wool	55.8	52.4	54.8	57.6	57.7	61.5	68.1	105.8	67.4	103.5
Dairy products	84.8	84.0	74.6	73.4	73.6	74.3	79.7	106.1	82.4	105.9
Forest products	91.6	107.1	103.7	103.7	103.7	103.7	106.9	111.8	107.9	111.5
Total agricultural products	62.2	62.9	62.8	62.6	61.4	63.2	89.3	103.0	85.5	102.6
CANADA										
(Internal Trade Branch										
of the Dominion Bureau of Statistics)										
1926 = 100.										
Field products (grain, etc.)	43.0	44.8	47.3	43.2	47.3	44.1	67.8	106.7	70.0	93.8
Animals and animal products	74.3	73.2	73.1	76.9	81.8	84.7	91.1	110.3	102.9	112.5
Total Canadian farm products	54.7	55.4	56.9	58.9	60.2	58.3	76.6	108.0	82.3	100.8
Fertilizers	86.8	86.9	86.9	86.9	86.5	86.5	91.5	96.3	88.2	92.6
General index-number	70.9	71.7	72.2	73.0	74.4	75.1	84.1	93.1	83.6	95.6
ESTONIA										
(Central Bureau of Statistics)										
1922 = 100										
Commodities imported . . . . .	...	92	93	91	90	81	75	95.3	79	95
Commodities exported . . . . .	...	82	64	62	63	68	84	109.3	83	112
Agricultural products imported and exported . . . . .	...	71	73	71	72	72	78	104.5	79	106

* For an explanation of the method of calculation of the index-numbers, reference should be made to the Institute's publication "Index-numbers of Prices of Agricultural Products and other Price-indices of interest to the Farmer" (Rome, 1930).
(1) Some data are provisional. — (2) Calculated by the "Statist", reduced to base-year 1913 = 100.

COUNTRIES AND CLASSIFICATION	August	July	June	May	April	March	August	August	Year	
	1931	1931	1931	1931	1931	1931	1930	1929	1930	1929
UNITED STATES (Bureau of Agricultural Economics) Average 1909-10 to 1913-14 = 100.										
Cereals	54	57	67	74	74	74	101	120	100	121
Fruits and vegetables	97	110	114	119	120	109	149	160	158	136
Meat animals	92	92	91	99	106	106	119	165	134	156
Dairy products	87	85	86	91	99	101	117	137	123	140
Poultry and poultry products	98	83	81	77	90	92	107	151	126	159
Cotton and cottonseed	53	71	65	74	78	80	94	146	102	145
Total agricultural products	75	79	80	86	91	91	108	143	117	138
Commodities purchased by farmers (1)	127	120	130	131	134	136	149	165	146	155
Agricultural wages (1)	—	—	123	—	—	127	(2) 160	(2) 173	152	170
UNITED STATES (Bureau of Labor) 1926 = 100.										
Grains	44.8	49.0	56.0	59.6	59.5	59.3	80.4	99.3	58.3	97.4
Livestock and poultry	66.0	63.0	61.9	64.1	70.8	70.7	84.6	112.8	89.2	106.1
Other farm products	67.3	71.3	70.8	71.5	73.4	74.2	86.7	105.8	91.1	106.6
Total farm products	63.5	64.9	65.4	67.1	70.1	70.6	84.9	107.1	83.3	104.9
Agricultural implements	94.5	94.5	94.6	94.7	94.7	94.7	94.9	98.3	95.1	97.9
Fertilizer materials	74.4	78.7	79.8	80.5	80.6	80.8	83.3	90.6	85.6	92.1
Mixed fertilizers	78.7	80.2	82.4	82.8	83.5	88.3	92.7	98.2	93.6	97.2
Cattle feed	50.8	55.8	61.1	67.9	81.2	82.1	104.8	124.7	99.7	121.6
Non-agricultural commodities	72.1	71.5	71.4	72.6	74.3	75.7	83.8	94.3	85.9	94.4
General index-number	70.2	70.0	70.0	71.3	73.3	74.5	84.0	97.7	86.3	96.5
FINLAND (Central Bureau of Statistics) 1926 = 100.										
Cereals	76	79	78	79	76	74	74	99	78	98
Potatoes	34	101	73	68	69	73	68	135	76	148
Fodder	60	65	65	67	71	70	63	65	62	69
Meat	64	65	66	67	66	73	92	106	85	108
Dairy products	72	70	70	71	73	74	88	101	84	108
Total agricultural products	70	71	70	71	73	75	83	97	82	100
General index-number	81	82	83	84	85	86	89	97	90	98
HUNGARY (Central Bureau of Statistics) 1913 = 100.										
Agricultural and livestock products	83	87	82	85	84	84	81	106	—	—
General index-number	92	95	91	93	93	94	93	114	—	—
ITALY (Consiglio Provinciale dell'Economia Corporativa di Milano) 1913 = 100.										
National agricultural products	330.21	337.05	348.32	357.20	356.36	345.90	413.48	499.34	413.39	508.76
General index-number	331.42	337.43	339.33	347.16	353.10	356.18	402.58	474.05	411.04	480.69
NEW ZEALAND (Census and Statistics Office) Average 1909-13 = 100.										
Dairy produce	103.7	96.7	88.8	93.6	89.4	104.8	123.9	143.6	120.7	145.7
Meat	127.9	126.0	125.7	128.5	128.1	125.4	154.3	172.5	164.7	178.9
Wool	68.9	73.2	74.2	76.7	76.6	60.3	102.4	166.5	100.7	170.9
Hides, skins, and tallow	82.1	83.4	82.3	95.1	84.0	78.4	153.4	200.4	145.4	188.6
Miscellaneous	93.9	122.1	129.2	130.7	134.1	144.0	112.0	143.8	134.0	146.7
Total agricultural products	100.5	100.1	99.3	96.2	90.0	95.1	131.5	166.2	126.7	161.3

1) 1910-14 = 100. — (2) July.

COUNTRIES AND CLASSIFICATION	August	July	June	May	April	March	August	August	Year	
	1931	1931	1931	1931	1931	1931	1930	1929	1930 (1)	1929
NORWAY (Kgl. Selskap for Norges Vel) Average 1909-14 = 100.										
Cereals	112	111	108	107	105	104	125	169	(2) 114	(2) 155
Potatoes	170	257	165	157	167	161	117	138	(2) 152	(2) 120
Pork	91	83	76	73	74	81	95	144	(2) 98	(2) 141
Other meat	158	160	153	166	162	172	220	205	(2) 193	(2) 199
Eggs	87	81	77	83	85	124	118	126	(2) 121	(2) 135
Dairy products	126	125	126	124	133	135	157	161	(2) 150	(2) 161
Concentrated feeding stuffs	102	103	105	108	111	108	122	158	(2) 117	(2) 148
Maize	79	81	87	85	85	83	114	162	(2) 103	(2) 148
Fertilizers	85	96	96	96	96	96	102	104	(2) 101	(2) 103
NETHERLANDS (Directie van den Landbouw) Average 1924-25 to 1928-29 = 100.										
Products of the soil	61	67	71	83	78	71	76	79	(3) 67	(3) 68
Animal products	68	70	71	72	74	74	86	100	(3) 77	(3) 95
Total agricultural products	67	69	71	74	75	73	88	95	(3) 75	(3) 88
Agricultural wages*	95	95	95	95	95	100	100	100	(3) 99	(3) 100
General index-number (4) . . . . .	...	65.6	67.7	69.0	69.0	69.7	77.1	96	79.2	96.1
POLAND (Central Bureau of Statistics) 1927 = 100.										
Products of the soil	47.7	48.2	62.3	68.3	64.7	50.8	56.4	69.1	52.1	73.1
Products of agricultural industry	62.1	64.1	72.9	77.2	75.4	63.4	70.2	80.7	69.9	80.9
Total products of plant origin	54.8	56.0	68.1	73.1	70.3	57.1	63.2	74.7	60.5	76.9
Animals	66.2	67.0	60.5	56.2	55.9	58.0	79.9	109.5	82.4	93.4
Dairy products	61.2	59.2	57.5	65.1	61.6	74.0	72.4	95.3	81.5	102.9
Total products of animal origin	64.2	63.6	59.3	60.1	58.5	64.8	76.5	99.8	81.9	100.2
Total agricultural products	58.3	58.8	63.8	66.8	64.5	59.8	68.2	84.3	63.5	85.7
Fertilizers	118.5	118.5	118.5	124.7	124.7	124.7	126.2	180.6	127.8	126.5
Industrial products	78.4	80.2	80.8	81.3	82.1	83.4	93.2	103.2	94.0	103.3
General index-number	69.3	70.4	73.2	74.8	74.1	72.5	81.8	95.1	82.3	95.7
YUGOSLAVIA (National Bank of the Kingdom of Yugoslavia) 1926 = 100.										
Products of the soil	75.7	78.9	77.8	80.5	77.6	78.3	93.9	106.3	89.8	118.6
Animal products	75.6	74.7	71.7	73.2	75.4	77.4	96.7	118.7	96.3	107.2
Industrial products	70.8	71.3	71.7	73.0	73.9	72.6	79.7	91.2	81.8	92.6
General index-number	73.6	74.4	73.8	75.4	75.5	74.8	87.7	98.6	86.6	100.6

(1) Some data are provisional. — (2) Agricultural year April 1-March 31. — (3) Agricultural year July 1-June 30. — (4) Calculated by the Central Statistical Bureau of the Netherlands, reduced to the base 1925-1929 = 100.

RATES OF FREIGHT

(Rates for full cargoes)

VOYAGES	Sept	Sept.	Sept.	August	August	Average			
	18,	11,	4,	28	21,	August	Sept.	Sept	Commercial
	1931	1931	1931	1931	1931	1931	1930	1929	Season
SHIPMENTS OF WHEAT AND MAIZE.									
									1930-31 1929-30
Danube to Antwerp/Hamburg . . . (shill per 2240 lbs.)	15/-	15/-	15/3	14/9	14/9	14/1½	15/-	18/6	13/11 15/8
Black Sea to Antwerp/Hamburg . . .	10/9	11/-	11/1½	11/-	10/9	10/5	11/9	n. q.	10/10 n. q.
St. John to Liverpool (1) . . .	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	1/6 1/5
Montreal to United Kingdom . . . (shill. per 480 lbs.)	1/10½	1/7½	1/6	1/7½	1/6	1/7	1/11	2/-	1/10 1/10
Gulf to United Kingdom . . .	n. 2/-	n. 2/-	2/1½	2/1½	2/1½	2/3	2/7½	3/-	2/3 2/6
New York to Liverpool (1) . . .	1/6	1/6	1/6	1/6	1/6	1/6	1/6	1/6	1/6 1/6
Northern Range to U.K. and Continent	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	n. q.	n. q.	1/4 1/9
North Pacific to United Kingdom (shill. per 2240 lbs.)	n. q.	n. q.	n. q.	n. 21/-	n. 21/-	n. 21/-	22/11	28/-	22/3 22/7
Vancouver to Yokohama (1) (dollars p. sh. ton) .	2.60	2.60	2.60	2.60	2.60	2.67	3.00	3.00	2.72 2.78
La Plata Down River (2) to U. K./Continent	16/-	16/3	16/3	16/3	16/6	16/9	15/4½	15/6	16/4 12/8
La Plata Up River (3) to U. K./Continent	17/6	17/9	18/-	18/-	18/-	18/3	16/11	17/1	18/- 14/4
Karachi to U. K./Continent (4) . . .	n. q.	n. q.	n. 18/-	18/8	18/8	18/8	19/8	n. q.	19/3 n. 15/4
Western Australia to U.K./Continent .	n. 23/9	23/9	n. q.	n. 26/-	n. 26/-	n. 26/-	33/4½	n. 30/9	29/8 25/7
SHIPMENTS OF RICE.									
									1930 1929
Saigon to Europe (shill. per 2240 lbs.)	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	n. 22/6	n. 25/6	n. 18/11 n. 26/1
Burma to U.K./Continent	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	n. 17/8 n. q.

(1) Rates for parcels by liners. — (2) "Down River", includes the ports Buenos Aires and La Plata. — (3) "Up River", includes the ports on the Paraná River as far as San Lorenzo. Cargoes from ports beyond San Lorenzo (Colastine, Santa-Fe and Paraná) are subject to an extra rate of freight. — (4) The original data being quoted in "scale terms", 10 % is added to arrive at freights per 2,240 lbs.

LATEST INFORMATION

France : The International Viticultural Commission has estimated total French and Algerian wine production at between 1,540 and 1,580 million Imperial gallons (1,850 and 1,900 million American gallons).

MONTHLY CROP REPORT

AND AGRICULTURAL STATISTICS

The following notes refer to crop conditions quoted in the crop reports and in the tables. — Crop condition according to the system of the country: Germany, Austria, Hungary, Luxemburg and Czechoslovakia: 1 = excellent, 2 = good, 3 = average, 4 = bad, 5 = very bad; France: 100 = excellent, 70 = good, 60 = fairly good, 50 = average, 30 = bad; Lithuania, Poland, Sweden and Switzerland: 5 = excellent, 4 = good, 3 = average, 2 = bad, 1 = very bad; Netherlands: 90 = excellent, 70 = good, 60 = fairly good, 50 = below average; U. S. S. R.: 5 = good, 4 = above the average, 3 = average, 2 = below average, 1 = bad; United States: 100 = crop condition which promises a normal yield. — For other countries the system of the Institute is employed: 100 = crop condition which promises a yield equal to the average of the last ten years

WORLD SUPPLIES AND REQUIREMENTS OF WHEAT

The grain season just begun follows a series of years characterised by a continued excess of production over consumption, which has brought about a progressive increase in the residual stocks at the end of each season. Production for the year is definitely below that of previous years and is insufficient to cover the requirements for consumption. The object of the present study is to estimate how much the present production falls below probable consumption in the year 1931-32, to forecast, therefore, what quantity will need to be drawn from existing stocks and consequently to calculate the probable level of stocks to be carried over to the season 1932-33. Although the value of the various elements used in the calculation has been carefully considered it is evident that the conclusions arrived at have only the value of approximate estimates because at the present period, the data of production are provisional and incomplete, the information available not furnishing all the factors necessary to form a final judgement and since the estimation of probable requirement is also rendered more uncertain than usual by the abnormality of the general economic and financial situation.

It may, moreover, be remarked that this review of the supplies and requirements of wheat is this year made more than a month earlier than in previous years and that consequently the information available is more than ordinarily uncertain and incomplete.

I. — EXPORTABLE QUANTITIES.

North America: The total supplies of Canada and the United States for home consumption and export during the present season are represented by the amount of production, estimated at 693 million centals (1,155 million bushels) plus stocks in existence on August 1, 1931, calculated at about 245 million centals (408 million bushels), in addition to about 40 million centals or 65 million bushels, considered as the minimum carry-over that is, a total quantity of 938 million centals (1,563 million bushels).

Home consumption in the two countries has in recent years normally absorbed about 450 million centals (750 million bushels); in the year 1930-31, however, following the deficient production of maize and low wheat prices compared with those of maize, there was an expansion of wheat consumption which reached 510 million centals

(850 million bushels). This year the maize crop, although below the average is much more abundant than that of last year, the barley and oat crops, on the contrary, are very poor. Home consumption of wheat should, therefore, in the current season also, be influenced by the relative scarcity of the cereal fodder crops, as well as by the fall in wheat prices, at present quoted in the United States at little more than half the level of last year. On the basis of these conditions the probable consumption in 1931-32 of the two countries together should amount to 500 million centals (830 million bushels), or about 50 (80) above the normal consumption and slightly below that of last year. The quantities available for export from North America would therefore be 440 million centals (735 million bushels) of which about 165 (275) of Canadian origin and 275 (460) from the United States.

Argentina : Stocks of the old crop on August, 1, 1931 amounted to 36 million centals (60 million bushels). As regards the new crop, which will be ripe at the end of the year and the sowing of which was finished only a couple of months ago, it is evident that only conjectural estimates can be made. The area sown, which is estimated at 17.2 million acres, has been greatly reduced (by about 20 %) since last year. The area on which the crop is destroyed by bad weather has in recent years averaged about 8 % of that sown. Applying this percentage of normal loss to the area sown this year, the area to be harvested is 16 million acres. The average yield of recent years has varied from a minimum of 10.3 bushels to a maximum of 15.6 bushels per acre, the average yield being 12.7.

As it seems likely that the reduction in grain sowings has occurred principally in the areas of minor productivity, it appears probable that from the 16 million acres estimated for harvest, there will be obtained, given normal weather, a yield slightly above the average. On this basis, taking into account that the growth of the crops has so far been satisfactory, it may be anticipated that the production of Argentina at the end of the year may be roughly 140 million centals (220 million bushels). It is obvious that this quantity may be somewhat raised or reduced according to the state of the weather from now until harvest time. The 140 million centals (220 million bushels) of the new crop would provide an exportable surplus of about 75 million centals (130 million bushels), which, together with the stocks of the old crop existing on August 1, would furnish a total round figure of wheat exportable during the season 1931-32 of about 110 million centals (190 million bushels).

Australia : Stocks of the old crop in existence on August 1, 1931 amounted to 20 million centals (33 million bushels). As regards the new crop to be cut at the end of the year, the basis of estimate is, as for Argentina, restricted to factors which are still uncertain. The wheat area has, this year, been reduced to under three-fourths of the area sown last year, that is, to about 13.5 million acres which, assuming yields a little above the average, should, according to the favourable news so far received concerning crop progress, produce about 90 million centals (150 million bushels) with an exportable surplus of about 55 million centals (100 million bushels). The total quantities exportable from Australia in 1931-32 of the old and new crops should therefore be about 75 million centals (130 million bushels).

India : After several years of poor or mediocre production India has experienced two consecutive years of fairly abundant production. Due to the necessity of replenishing to the normal stocks which had been greatly reduced in the years of poor production and also due to the expansion of home consumption as a consequence of low prices, India has continued to remain absent as a grain supplier from the international market and in fact imported last season 3 million centals (5 million bushels). Nor in the season

which has now opened will India be in a position to resume her position of exporter but will still have to continue to draw supplies from the foreign market to completely meet home requirements.

U. S. S. R. : No official estimates of this year's crop are available but it now seems certain that the winter wheat crop has given heavy yields, while the spring crop, which represents two-thirds of the total, was rather poor. The total crop appears to be rather below that of last year, which permitted an export of about 65 million centals (110 million bushels). From August 1 to September 30 of this year, the U. S. S. R. has already marketed 25 million centals (40 million bushels), that is, over double the quantity of the corresponding period of 1930. It is generally considered that this fact does not constitute an index of a larger exportable surplus this year, but that the acceleration of shipments is bound up with the urgent need for foreign currency to finance the purchase of supplies required for the industrial equipment in the country. It is therefore forecast that the Russian grain exports will soon weaken and remain much below those of 1930-31. In the absence of reliable data, it may be conjectured that the quantity that the U. S. S. R. will place on the foreign market in the present season will be about 45 million centals (75 million bushels) or 20 million centals (35 million bushels) below that of 1930-31.

Danubian countries : The total crop of Bulgaria, Hungary, Rumania and Yugoslavia, on the basis of recent estimates, is somewhat better than the preliminary estimates gave reason to believe. It reaches 205 million centals (345 million bushels) against 212 (353) in 1930 and 185 (310) on the average of the preceding quinquennium. In these countries also the estimation of exportable surpluses presents some difficulties, as home consumption fluctuates considerably from year to year, especially in relation to the supplies and prices of maize consumed widely as food by large sections of the population.

Last season, these four countries, with a total wheat production of 212 million centals (353 million bushels), exported only 27 (44) as the maize crop was barely an average one. This year, on the contrary, a heavy crop was obtained and maize prices, which fell relatively much lower than those of wheat, should induce a larger home consumption in substitution for wheat. The available surplus of wheat for export should therefore, in spite of the smaller production, be larger than last year and may be calculated at a minimum of 35 million centals (55 million bushels).

North Africa : In the three exporting countries of North Africa, where production and consumption of cereals is limited principally to the wheat and barley crops, both of these cereals have yielded fairly in Algeria and heavily, on the contrary, in Morocco and Tunis. On the whole, crops seem to be somewhat better than those of 1930. The quantities of wheat exportable in the current season should be slightly larger than in 1930-31 when shipments amounted to about 10 million centals (16 million bushels), and may be estimated at a total of 12 million centals (20 million bushels), originating chiefly in Morocco.

Quantities afloat : The quantities of wheat afloat as at the beginning of August may be estimated to nearly equal those at the beginning of last season, namely about 23 million centals (35 million bushels).

Total exportable quantities : Summarising, the quantities of wheat which may be placed at the disposal of the importing countries during the grain season 1931-32 (compared with figures for previous year) are estimated as follows :

Exportable quantities of Wheat.

(millions centals)

	1931/32	1930/31	1929/30	1928/29	1927/28	1926/27
Canada	165	238	185	310	243	203
U S. A	275	229	231	210	161	161
Argentina.	110	110	112	194	150	117
Australia	75	110	60	82	57	77
U. S. S. R	45	65	4	0	0	25
India.	0	0	0	0	5	7
Danubian Countries	35	27	31	21	19	26
North Africa	12	10	9	8	6	0
Afloat	23	24 (1)	44	27	28	23
Totals	740	813	676	852	669	639

(million bushels)

Canada	275	397	310	514	404	338
U S A.	460	382	386	349	268	272
Argentina.	190	186	187	323	250	195
Australia	130	185	100	136	96	129
U. S. S. R.	75	108	7	0	0	40
India.	0	0	0	0	8	11
Danubian Countries	55	44	53	35	31	44
North Africa	20	16	15	14	10	0
Afloat	35	39 (1)	75	45	46	39
Totals	1,240	1,350	1,130	1,420	1,110	1,070

II. — REQUIREMENTS OF THE IMPORTING COUNTRIES.

Europe : Europe normally absorbs $3/4$ of the world wheat export and therefore represents the market of fundamental importance for the disposal of the surpluses of the exporting countries. The possession of practically complete data of production and trade by grain seasons for the different European countries permits an exact calculation of the apparent consumption of the whole continent; the results of the calculation for the last few years are given in the following table. On the basis of these figures and the preliminary estimates of production this year may be calculated even if only provisionally, probable requirements in the season which has just opened.

(1) See appendix.

Production and apparent consumption of wheat in Europe.

Importing Countries			Exporting Countries (1)			Total Europe			
Production	Net import	Apparent consumption	Production	Net exports	Apparent consumption	Production	Net imports	Apparent consumption	
(million centals)									
1925-26 . .	666	311	977	176	24	152	842	287	1,129
1926-27 . .	554	392	946	176	26	150	730	366	1,096
1927-28 . .	601	390	991	164	19	145	765	371	1,136
1928-29 . .	625	389	1,014	220	21	199	845	368	1,213
1929-30 . .	688	304	992	182	32	150	870	272	1,142
1930-31 . .	609	362	971	212	27	185	821	335	1,156
1931-32 . .	635	...	...	205	...	...	840	...	...
(million bushels)									
1925-26 . .	1,110	518	1,628	294	40	254	1,404	478	1,882
1926-27 . .	922	654	1,576	294	44	250	1,216	610	1,826
1927-28 . .	1,002	650	1,652	272	31	241	1,274	619	1,893
1928-29 . .	1,041	649	1,690	367	36	331	1,408	613	2,021
1929-30 . .	1,147	506	1,653	303	53	250	1,450	453	1,903
1930-31 . .	1,015	603	1,618	353	45	308	1,368	558	1,926
1931-32 . .	1,055	...	...	345	...	...	1,400	...	...

Total European production in 1931 is estimated, on the basis of the present estimates, at 840 million centals (1,400 million bushels), of which 635 (1,055) produced by importing countries and 205 (345) by the four Danubian countries. The importing countries, therefore, have a crop about 25 million centals (40 million bushels) larger than in 1930, while the four Danubian countries record a slight decrease of 7 million centals (8 million bushels); the total European crop apparently exceeds that of last year by 19 million centals (30 million bushels). If consumption in 1931-32 remains within the limits of last season, in which 1,155 million centals (1,930 million bushels) were consumed (a nearly normal quantity compared with the average consumption of recent years), the requirements of the European importing countries would be about 350 million centals (590 million bushels) of which 35 (55) could be furnished by the Danubian countries. An import of 315 million centals (535 million bushels) from the non-European countries would therefore suffice, together with a home production of 840 (1,400), to meet the assumed consumption of 1,155 (1,935). This estimate of an import

(1) Bulgaria, Hungary, Rumania and Yugoslavia.

requirement of 350 million centals (590 million bushels) nearly coincides with the trade estimates ; a well known British expert places it at 340 million centals (568 million bushels). It is in fact considered that the expansion of consumption as a result of low prices on the markets of the exporting countries, is offset by tariff burdens, by wheat milling regulations and by the use of substitutes. Even taking due account of the barriers to an increase of consumption and to the replenishment of wheat stocks, which were reduced to a minimum in the last season, it must be admitted that there still exist other factors, which, on the contrary, favour an expansion of consumption.

Prices in the importing countries, despite the raising of tariff duties, remain below those current a year ago ; the economic crisis, curtailing the purchasing power of large masses of the population, encourages the consumption of cheaper foodstuffs at the expense of the dearer ones ; the regulations introduced concerning the proportion of home-grown grain to be milled will be revised or suspended as the season advances ; the use of substitutes for wheat, whether potatoes, rice or other foodstuffs, is not easy technically and is hindered by the low price of wheat. But, besides these reasons for a greater absorption of wheat, there is another that appears to have a still greater influence, namely, the very poor production of rye, a bread cereal which is consumed by large masses of the populations of central and north-eastern Europe, where it constitutes the basic foodstuffs. The last rye crop in Europe was very poor ; it did not reach 440 million centals (730 million bushels), showing a decrease of nearly 90 million (150) compared with last year and of 70 million (110) compared with the average of 1925-29. A decrease of 90 million centals (150 million bushels) in the production of a cereal that is predominantly used for bread making should have no small effects on the consumption of wheat. For all these reasons it is considered to be improbable that the consumption of wheat in Europe in the present season will equal that of the season 1930-31 but on the contrary, should considerably exceed it. A consumption of 1,200 million centals (2,000 million bushels) compared with 1,155 (1,935) in 1930-31 appears to be a reasonable and prudent estimate. This consumption would require a total import of 390 million centals (640 million bushels) from the exporting countries, of which about 35 (55) could be furnished by the Danubian countries and the remainder by the overseas surplus producing countries and the U. S. S. R.

Non-European countries : For most of these countries no monthly trade statistics are available for the calculation of the amount of their imports by grain season. It is, therefore, necessary to make an indirect calculation, the details of which are given in the appendix and from which it is found that the wheat imports of these countries combined have, in recent years, fluctuated between 90-120 million centals (150-200 million bushels) with a maximum of nearly 150 million centals (250 million bushels) in 1928-29, which coincides with the large purchases made in that period by some Asiatic countries (China, Japan and India) and the U. S. S. R. This heterogeneous block of countries, including also those countries which, normally exporters, are in exceptionally bad crop years obliged to import, shows a marked tendency to absorb increasing quantities of wheat and its potential power of absorption varies predominantly according to current market prices. Undoubtedly, the present level to which wheat prices have fallen, could not have failed to stimulate intensely the consumption of these countries and bring about a large increase, if their present purchasing power had not been greatly reduced by the general crisis and by the fact that countries having a silver currency and the producers of tropical and sub-tropical commodities, among which are numbered the largest non-European consumers of wheat, such as central-South America, Egypt, China and other Asiatic countries, are particularly depressed. Even excluding the possibility, therefore, that the low price may result in a large and steady expansion of consumption in these coun-

tries, it may yet be considered that it will not be completely without its effects and may ultimately give rise to a moderate increase. Moreover, it must be borne in mind that in China, due to the grave damage caused by the recent floods, the necessity to provide food for large masses of destitute people, will contribute to increase the demand for wheat, also that in Japan the rice crop is apparently poor and, lastly, that it is anticipated that India will again import wheat until the harvest of the new crop in March. All these factors combined seem sufficient to produce, during the present season, a further increase of demand for wheat by the non-European countries. There are already evident signs of larger consumption in the shipment made to such destinations in the two months August and September, which show an increase of about 50 % compared with the corresponding quantities of 1930. As, in the whole of the season 1930-31, the imports of the non-European countries reached 120 million centals (200 million bushels), an estimate may be made of imports in the current season by making an addition of 20 million centals (40 million bushels), the resulting figure being 140 million centals (240 million bushels).

World requirements: Summarising, the total quantities needed to meet the requirements of importing countries during the season 1931-32 should be about 390 million centals (640 million bushels) for Europe and 140 million (240 million) for the non-European countries, that is, a total of 530 million centals (880 million bushels).

III — THE SITUATION OF WHEAT SUPPLIES AND REQUIREMENTS.

In order to summarise the statistical situation of the present grain season, as resulting from the data now available, there have been grouped in the following table data illustrating its salient features, compared with those of the last five years.

World production in 1931, excluding the U. S. S. R., appears to be much smaller than last year and also slightly below the average of the preceding quinquennium. The production of the U. S. S. R., data for which are still lacking, is not abundant and in any case is much smaller than that of last year. Total production is not, on the whole, sufficient to cover the requirements of consumption.

World exportable supplies, even taking account of the exceptional stocks in existence at the beginning of the season, are smaller than those of last year by nearly 75 million centals (110 million bushels).

The probable requirements of the importing countries appear on the contrary to be larger than in 1930-31; an increase is anticipated in European demands, due principally to the poor rye crop, reduced by 90 million centals (150 million bushels) compared with 1930, and also an increase in non-European demands due principally to the expansion of consumption stimulated by low prices and the precarious food situation in vast regions of China. Total world import requirements are estimated at 530 million centals (880 million bushels) with an increase compared with last season of about 50 million centals (80 million bushels).

To meet these requirements, as exportable supplies of this year's new crops are not sufficient, it will be necessary to draw upon stocks of the old crop in existence in the exporting countries. These stocks on August 1 were estimated at 329 million centals (546 million bushels), a quantity representing the maximum accumulation of surpluses so far recorded. The part of this excessive accumulation which may be consumed in the present season is estimated at about 120 million centals (180 million bushels), a quantity which approximately represents the deficit of world production in 1931 relative to world requirements.

Wheat.

	1931-32	1930-31	1929-30	1928-29	1927-28	1926-27
Millions centals.						
World production (excluding the U. S. S. R.)	* 2,120	2,226	2,071	2,362	2,174	2,039
Production of the U. S. S. R. . . . .	...	650	421	476	472	540
Production of the exporting countries.	* 1,380	1,510	1,261	1,627	1,457	1,387
Production of the importing countries	* 740	716	810	785	717	652
Exportable supplies (excluding the U. S. S. R.).	* 695	748	672	852	660	614
Exportable supplies of the U. S. S. R.	* 45	65	4	0	0	25
Total quantities imported	* (2) 530	484	396	532	481	492
Exportable stocks residual at the end of season.	* 210	329	280	320	188	147
Million bushels.						
World production (excluding the U. S. S. R.)	* 3,540	3,712	3,450	3,986	3,623	3,395
Production of the U. S. S. R. . . . .	.	1,084	702	794	786	915
Production of the exporting countries (1).	* 2,300	2,517	2,102	2,712	2,420	2,311
Production of the importing countries	* 1,240	1,195	1,348	1,224	1,194	1,084
Exportable supplies (excluding the U. S. S. R.).	* 1,165	1,242	1,123	1,420	1,110	1,030
Exportable supplies of the U. S. S. R.	* 75	108	7	0	0	40
Total quantities imported	* (2) 880	804	662	886	801	819
Exportable stocks residual at end of season.	* 360	546	468	536	309	251
Prices. — <i>Hard winter, No 2, spot, cents per bushel at Chicago.</i>						
Minimum price.	(3) 48	50 ½	87 ½	98	128 ½	130 ¾
Maximum price	(3) 53 ¼	96 ½	136 ½	143	168 ½	153
Average annual price.	(3) 50 ¾	78	114 ¾	117 ¾	137 ¾	141 ½

* Forecast. — (1) Canada, United States, Argentina, Australia, India, Bulgaria, Hungary, Rumania, Yugoslavia, Algeria, Morocco and Tunis. — (2) Probable requirements of the importing countries. — (3) Period August 1 — October 15 1931.

On this basis it is estimated that stocks, which at the beginning of the season reached 329 million centals (546 million bushels), will be reduced on 1 August 1932 to 210 million centals (360 million bushels), that is, to proportions still above the normal but not such as to weigh excessively on the market.

G. CAPONE

APPENDIX

In the following notes are given the detailed data on which the estimates contained in the present study are based.

I. PRODUCTION.

The totals of world production, calculated on the basis of the most recent estimates, are given in the following table.

<i>Production of wheat.</i>						
	1931	1930	1929	1928	1927	1926
	Million Centals.					
Europe	840	821	871	847	765	732
North America . .	700	763	675	895	822	750
South America . .	165	165	132	243	203	163
Asia . .	250	273	229	205	236	229
Africa . .	70	72	82	71	71	94
Australasia and Oceania	95	132	82	101	77	101
Totals . .	2,120	2,226	2,071	2,362	2,174	2,039
U.S.S.R. . .	...	650	421	476	472	549
	Million Bushels.					
Europe . .	1,400	1,368	1,463	1,411	1,275	1,216
North America . .	1,170	1,272	1,124	1,492	1,371	1,249
South America . .	280	276	220	404	338	272
Asia . . .	410	458	382	342	393	382
Africa . .	120	118	135	118	118	107
Australasia and Oceania	160	220	136	169	128	169
Totals . .	3,540	3,712	3,450	3,936	3,623	3,395
U.S.S.R. . .	...	1,084	702	794	786	915

II. EXPORTABLE STOCKS REMAINING FROM PREVIOUS PRODUCTION

The exportable stocks residual from the previous production in existence on August 1, 1931 compared with those for the preceding five seasons have been calculated, for the four large exporting countries only, in the manner indicated below. The stocks in existence in the other exporting countries are excluded because there is an absence of data for exactly estimating them and also because normally the variations in these stocks from year to year are of negligible importance:—

1. CANADA. — Official statistics record the subjoined estimates of residual stocks of wheat and flour in Canada on August 1. In addition to these stocks there must also be taken into account those of Canadian grain admitted free into the United States and lying there on August 1. They amounted to the following quantities.

	1926	1927	1928	1929	1930	1931
	Million Centals.					
In Canada .	21.8	30.5	46.6	62.6	67.0	80.0
In U. S. A.	2.2	3.0	8.2	13.8	9.7	3.7
Totals . .	24.0	33.5	54.8	76.4	76.7	83.7
	Million Bushels.					
In Canada .	36.3	50.8	77.6	104.4	111.7	133.4
In U. S. A.	3.7	4.8	13.6	23.6	16.5	6.2
Totals . . .	40.0	55.6	91.2	128.0	128.2	139.6

The minimum carry-over from one season to the next may be placed at about 5.5 million centals (or 9.2 million bushels) so that the actual exportable stocks of Canadian grain on August 1 in North America were:

	1926	1927	1928	1929	1930	1931
	Million Centals.					
18.5	28.0	49.3	70.9	71.2	78.2	
	Million Bushels.					
30.8	46.4	82.0	117.8	119.0	130.4	

2. UNITED STATES. — The official statistics record the stocks of home grown wheat in the United States on July 1. In addition to these stocks there must also be taken account those of U. S. A. grain admitted free into Canada and lying there on July 1. They were: as follows.

	1926	1927	1928	1929	1930	1931
	Million Centals.					
In farmers' hands . .	12.6	16.3	14.2	27.3	28.3	19.3
Commercial visible supply . . .	9.9	12.6	23.2	54.3	65.6	122.5
In country mills and elevators .	17.7	13.1	11.6	24.9	36.1	18.3
In merchant mills and elevators .	14.7	22.2	19.2	29.0	28.0	13.1
Flour (as wheat) . .	¹⁾ 5.9	¹⁾ 5.4	10.2	10.8	10.0	8.0
In transit .	4.4	6.8	6.5	9.7	8.8	7.3
In other mills . .	...	...	...	...	7.5	11.0
In U. S. A. ²⁾ 68.5	²⁾ 84.0	²⁾ 86.0	²⁾ 160.0	184.3	199.5	
In Canada .	0.5	1.0	1.5	2.0	3.0	9.2
Totals .	69.0	85.0	87.5	162.0	187.3	208.7

(1) Incomplete. — (2) Raised to represent all items and rounded.

	1926	1927	1928	1929	1930	1931
	Million Bushels.					
In farmers' hands . .	21.0	27.2	23.7	45.5	47.2	32.1
Commercial visible supplies . .	16.5	21.1	38.6	90.4	109.3	204.2
In country mills and elevators .	29.5	21.8	19.3	41.5	60.2	30.6
In merchant mills and elevators .	24.5	37.0	31.9	48.3	46.7	21.8
Flour (as wheat) . .	1)9.8	1)9.1	17.1	18.0	16.6	13.3
In transit .	7.3	11.3	10.9	16.2	14.7	12.2
In other mills . .	...	...	...	...	12.5	18.4
In U. S. A. ²⁾	115.0	140.0	145.0	265.0	307.2	332.6
In Canada .	1.0	1.4	2.5	3.3	4.7	15.3
Totals .	116.0	141.4	147.5	268.3	311.9	347.9

The minimum carry-over from one season to the next assuming as a basis for deduction about one-twelfth of the annual home consumption, may be placed at 33.0 million centals (or 55.0 million bushels) so that the actual exportable stocks of home-grown wheat on 1st July were:

	1926	1927	1928	1929	1930	1931
million centals . . .	36.0	52.0	54.5	129.0	154.3	175.7
million bushels . . .	61.0	86.4	92.5	213.3	256.9	292.9

Taking into account the exports during July,

	1926	1927	1928	1929	1930	1931
million centals . . .	11.2	6.8	2.9	7.3	8.8	9.3
million bushels . . .	18.7	11.4	4.9	12.2	14.7	15.4

the exportable stocks on 1st August were as follows:

	1926	1927	1928	1929	1930	1931
million centals . . .	24.8	45.2	51.6	121.7	145.5	166.4
million bushels . . .	42.3	75.0	87.6	201.1	242.2	277.5

3. ARGENTINA. — Taking into account exports and stocks on 1 January, the exportable stocks on 1 August of each year were as follows:

	1926	1927	1928	1929	1930	1931
million centals . .	28.7	29.5	41.0	61.1	21.4	35.9
million bushels . . .	47.8	49.2	68.3	101.8	35.6	60.0

(1) Incomplete. — (2) Raised to represent all items and rounded.

4 AUSTRALIA — Exportable stocks on 1 August of each year were as follows:

	1926	1927	1928	1929	1930	1931
million centals . .	7.3	16.5	16.1	17.4	23.3	19.8
million bushels . .	12.1	27.6	26.8	29.0	39.0	33.1

III CONSUMPTION OF THE EXPORTING COUNTRIES.

In the following table are given for each country the data on which the figures of home consumption in the four large exporting countries have been based.

1. CANADA. — Based on official data of yield, trade and stocks, the consumption in the last five years is estimated as follows:—

	1926-27	1927-28	1928-29	1929-30	1930-31
	Million Centals.				
Yield	244.3	287.8	340.0	182.7	238.7
+ Internal Stocks at the opening of season . . .	21.8	30.5	46.5	62.6	67.0
= Supply available at opening of season . . .	266.1	318.3	386.5	245.3	305.7
— Season's exports	174.7	198.6	242.7	110.4	154.5
— Internal Stocks at the close of season	30.5	46.5	62.6	67.0	80.0
= Consumption .	60.9	73.2	81.2	67.9	71.2

	Million Bushels.				
Yield	407.1	479.7	566.7	304.5	397.9
+ Internal Stocks at opening of season . . .	36.4	50.8	77.6	104.4	111.7
= Supply available at opening of season	443.5	530.5	644.3	408.9	509.6
— Season's exports	291.1	331.1	404.5	184.1	257.6
— Internal Stocks at close of season	50.8	77.6	104.4	111.7	133.4
= Consumption .	101.6	121.8	135.4	113.1	118.6

2. UNITED STATES. — Based on official data for yield, trade and stocks, the consumption in the last five years is estimated as follows:—

	1926-27	1927-28	1928-29	1929-30	1930-31
Million Centals.					
Yield	498.6	527.0	549.0	485.5	518.0
+ Stocks on July 1	68.5	84.0	86.0	160.0	184.3
= Supply available on July 1	567.1	611.0	635.0	645.5	702.3
— Season's exports	122.6	113.5	84.5	83.2	66.7
— Stocks at close of season . . .	84.0	86.0	160.0	184.3	199.5
= Consumption	360.5	411.5	390.5	378.0	436.1
Million Bushels.					
Yield	831.0	878.4	914.9	809.2	863.4
+ Stocks on July 1	115.0	140.0	145.0	265.0	307.2
= Supply available on July 1	946.0	1,018.4	1,059.9	1,074.2	1,170.6
— Season's exports	204.3	189.1	140.8	138.7	111.0
— Stocks at the close of season	140.0	145.0	265.0	307.2	332.6
= Consumption	601.7	684.3	654.1	638.3	727.0

3. ARGENTINA. — Based on official data, the consumption in the last five years is estimated as follows. —

	1926	1927	1928	1929	1930
Million Centals					
	52.6	44.6	46.0	51.6	51.6
Million Bushels					
	87.7	74.1	77.0	86.0	86.0

4. AUSTRALIA. — Based on official data for production and trade the consumption in the last five years is estimated as follows.

	1926	1927	1928	1929	1930
Million centals . .	25.4	26.7	29.8	30.9	33.0
Million bushels . .	42.3	44.4	49.6	51.4	55.0

IV. EXPORTS.

The quantities of wheat (and flour reduced to the corresponding equivalents in grain) exported during the last five grain seasons (August 1-July 31) from all the principal exporting countries are given in the following table. The data refer to net exports, that is, exports less imports.

Net exports.					
Country	1926-27	1927-28	1928-29	1929-30	1930-31
Million Centals.					
Canada . . .	174.6	198.6	242.7	110.4	154.5
United States .	118.1	109.5	88.9	84.9	67.5
Argentina . . .	85.8	106.5	132.9	90.4	73.6
Australia . . .	60.6	41.7	64.2	36.7	90.4
India	6.8	5.1 (1)	15.0	0.2	(1) 3.0
Bulgaria . . .	1.3	1.1	0.2 (1)	0.9	3.5
Hungary . . .	12.8	12.8	15.2	17.5	10.6
Rumania . . .	6.6	4.4	1.0	1.7	9.2
Yugoslavia . .	5.7	0.4	5.3	13.7	3.4
Algeria	(1) 0.9	3.1	2.0	2.8	6.0
Tunis	0.2	0.4	3.1	3.5	3.5
Morocco . . .	0.0	2.2	3.1	2.4	0.7
Chile	(1) 0.2	0.0	0.2	0.7	0.6
Totals . . .	472.9	485.6	558.8	364.9	423.5
U. S. S. R . .	25.0	0.0 (1)	5.0	4.4	64.6
Grand Totals	497.9	485.6	558.8	369.3	488.1

Country	1926-27	1927-28	1928-29	1929-30	1930-31
Million Bushels of 60 lbs.					
Canada	291.0	331.1	404.5	184.0	257.5
United States	196.9	182.2	148.1	141.5	112.4
Argentina . . .	142.9	177.5	221.6	150.6	122.6
Australia . . .	101.0	69.4	106.9	61.1	150.6
India	11.4	8.5 (1)	25.0	0.4 (1)	5.0
Bulgaria . . .	2.2	1.8	0.4 (1)	1.4	5.9
Hungary . . .	21.3	21.3	25.4	29.2	17.7
Rumania . . .	11.0	7.3	1.4	2.8	15.4
Yugoslavia . .	9.6	0.7	8.8	22.9	5.6
Algeria	(1) 1.5	5.1	3.3	4.8	9.5
Tunis	0.4	0.7	5.1	5.8	5.8
Morocco	0.0	3.7	5.1	4.0	1.0
Chile	(1) 0.4	0.0	0.4	1.2	0.9
Totals . . .	787.3	809.3	931.0	608.3	704.9
U S S R . . .	40.0	0.0 (1)	7.0	7.4	107.6
Grand Totals	827.3	809.3	931.0	615.7	812.5

Taking account, however, of the fact that for several years part of the exports from Canada and the United States has not actually been shipped overseas but has passed from one to the other of these countries to remain in store at its destination, there has been deducted from the total exports above indicated, the amounts of which are increased from the beginning to the end of each season, the stores of Canadian wheat in the United States and those of United States wheat in Canada. On the other hand the inverse operation has been carried out when, as in 1929-30, the amounts stored are decreased. The variations in the stores of foreign wheat in the United States and Canada between the beginning and end of each season have been as follows:—

	1926-27	1927-28	1928-29	1929-30	1930-31
million centals	+ 1.1	+ 5.5	+ 6.0	— 3.1	+ 5.1
million bushels	+ 1.8	+ 9.2	+ 10.0	— 5.1	+ 8.5

In consequence, the total world exports are modified as follows:

million centals	496.8	480.1	552.8	372.4	483.0
million bushels	825.5	800.1	921.0	620.8	804.0

V. IMPORTS AND APPARENT CONSUMPTION OF EUROPE.

The data of production, net trade movement and apparent consumption of the various European countries grouped as importing and exporting countries respectively are given in the following table together with the preliminary estimates of production for 1930. The figures for wheat include flour reduced to its equivalent in grain.

(1) Net imports, not included in the totals.

Production and apparent consumption of Europe.

COUNTRIES	Pro- duction in 1928	Imports 1928-29	Apparent Consump- tion 1928-29	Pro- duction in 1929	Imports 1929-30	Apparent Consump- tion 1929-30	Pro- duction in 1930	Imports 1930-31	Apparent Consump- tion 1930-31	Pro- duction in 1931
(Million Centals)										
<i>A. Importing countries:</i>										
Germany	84.9	46.7	131.6	73.8	28.6	102.4	83.5	18.7	102.2	94.0
Austria	7.7	8.4	16.1	6.9	11.4	18.3	7.2	9.3	16.5	5.6
Belgium and Luxemburg	10.8	25.1	35.9	8.1	25.4	33.5	8.2	23.0	36.2	9.4
Denmark	7.3	9.9	17.2	7.1	4.7	11.8	6.1	6.9	13.0	..
Spain	73.6	10.4	84.0	92.5	2.1	94.6	88.0	0.0	88.0	78.5
Estonia	0.7	0.7	1.4	0.8	0.7	1.5	1.0	0.5	1.5	0.4
Finland	0.6	4.0	4.6	0.4	3.3	3.7	0.7	3.0	3.7	0.7
France	163.9	32.0	200.9	202.4	6.6	209.0	138.7	36.6	175.3	..
Gr. Brit. and N. Ireland	29.8	120.2	150.0	29.9	122.9	152.8	25.3	134.8	160.1	..
Greece	7.9	13.2	21.1	6.9	13.0	19.9	7.2	14.5	21.7	..
Irish Free State	0.7	10.8	11.5	0.7	10.3	11.0	0.7	11.3	12.0	..
Italy	137.1	52.7	189.8	153.1	25.3	181.4	126.0	48.8	174.8	148.8
Latvia	1.5	1.8	3.3	1.4	1.5	2.9	2.4	0.9	3.3	2.1
Lithuania	3.7	0.0	3.7	5.6	0.0	5.6	(1)	0.6	6.2	5.1
Norway	0.4	5.3	5.7	0.4	4.0	4.4	0.4	5.0	5.4	0.5
Netherlands	4.4	17.6	22.0	3.3	13.1	21.4	3.6	20.9	24.5	3.8
Poland	35.5	1.5	37.0	39.5	(1)	39.4	49.4	(1)	46.8	45.4
Portugal	4.6	(3) 4.2	8.8	6.5	4.0	10.5	8.3	1.6	9.9	..
Sweden	11.0	4.9	15.9	11.4	4.4	15.8	12.0	2.9	15.8	11.8
Switzerland	2.6	9.9	12.5	2.5	9.6	12.1	2.3	11.1	13.4	2.6
Czechoslovakia	30.9	10.1	41.0	31.7	7.9	39.6	30.4	10.3	40.7	23.0
Totals	624.6	389.4	1,014.0	687.9	303.7	991.6	609.1	361.9	971.0	(2) 635.0
<i>B. Exporting countries:</i>										
Bulgaria	29.5	(1) 0.2	29.3	19.9	4) 0.9	20.8	34.4	(1) 3.5	30.0	36.7
Hungary	59.5	(1) 15.2	44.3	45.0	(1) 17.5	27.5	50.6	(1) 10.6	40.0	39.4
Rumania	69.3	(1) 0.9	68.4	59.9	(1) 1.7	58.2	73.5	(1) 9.2	69.3	76.7
Yugoslavia	62.0	(1) 5.3	56.7	57.0	(1) 13.7	43.3	48.2	(1) 3.4	44.8	50.8
Totals	220.3	(1) 21.6	198.7	181.8	(1) 32.0	149.8	211.7	(1) 26.7	185.0	205.0
General totals	844.9	367.8	1,212.7	869.7	271.7	1,141.4	820.8	335.2	1,156.0	(2) 840.0
(Million Bushels).										
<i>A. Importing countries</i>										
Germany	141.5	77.9	219.4	123.1	47.6	170.7	139.2	31.1	170.3	156.7
Austria	12.9	14.0	26.9	11.6	19.0	30.6	12.0	15.6	27.6	9.3
Belgium and Luxemburg	18.0	41.9	59.9	13.5	42.3	55.8	13.6	46.7	60.3	15.7
Denmark	12.1	16.5	28.6	11.8	7.8	19.6	10.2	11.5	21.7	..
Spain	122.6	17.3	139.9	154.2	3.4	157.6	146.7	0.0	146.7	130.8
Estonia	1.1	1.1	2.2	1.3	1.2	2.5	1.6	0.8	2.4	0.8
Finland	1.0	6.6	7.6	0.8	5.5	6.3	1.2	4.9	6.1	1.1
France	231.5	53.3	334.8	337.2	11.0	348.2	231.1	61.0	292.1	..
Gr. Brit. and N. Ireland	49.6	200.2	249.8	49.8	204.8	254.6	42.2	224.7	266.0	..
Greece	13.2	22.0	35.2	11.4	21.7	33.1	12.0	24.1	36.1	..
Irish Free State	1.1	13.0	19.1	1.1	17.2	18.3	1.1	18.8	19.9	..
Italy	228.5	87.8	316.3	260.1	42.2	302.3	210.1	81.4	291.5	247.0
Latvia	2.6	2.9	5.5	2.3	2.5	4.8	4.1	1.5	5.6	3.5
Lithuania	6.2	0.0	6.2	9.3	0.0	9.3	11.3	(1)	10.3	8.6
Norway	0.7	8.8	9.5	0.7	6.7	7.4	0.7	8.3	9.0	0.8
Netherlands	7.3	29.4	36.7	5.5	30.2	35.7	6.1	34.8	40.9	6.3
Poland	59.2	2.6	61.8	65.9	(1) 0.2	65.7	82.3	(1) 4.3	78.0	75.7
Portugal	7.7	(3) 7.0	14.7	10.3	6.6	17.4	13.8	2.7	16.5	..
Sweden	18.3	8.1	26.4	19.0	7.3	26.3	21.5	4.9	26.4	19.6
Switzerland	4.4	16.5	20.9	4.2	16.0	20.2	3.8	18.5	22.3	4.4
Czechoslovakia	51.4	16.9	68.3	52.9	13.2	66.1	50.6	17.2	67.8	38.3
Totals	1,040.9	643.8	1,689.7	1,146.5	506.0	1,652.5	1,015.2	603.2	1,618.4	(2) 1,055.0
<i>B. Exporting countries</i>										
Bulgaria	49.2	(1) 0.4	48.8	32.2	4) 1.4	34.6	57.3	(1) 5.9	51.4	61.2
Hungary	99.2	(1) 25.4	73.8	75.0	(1) 29.2	45.8	84.3	(1) 17.7	66.6	65.7
Rumania	115.5	(1) 1.5	114.0	99.8	(1) 2.8	97.0	130.8	(1) 15.4	115.4	127.9
Yugoslavia	108.2	(1) 8.8	94.4	95.0	(1) 22.9	72.1	80.3	(1) 5.6	74.7	84.7
Totals	367.1	(1) 36.1	331.0	303.0	(1) 53.5	249.5	352.7	(1) 44.6	308.1	345.0
General total	1,408.0	612.7	2,020.7	1,449.5	452.5	1,902.0	1,367.9	558.6	1,926.5	(2) 1,400.0

(1) Exports. — (2) Partly estimated. — (3) Estimate. — (4) Imports.

VI. NON-EUROPEAN IMPORTS.

The imports of non-European countries are calculated in a somewhat approximate fashion, by taking the difference between aggregate exports and imports of European countries, and also the quantities afloat at the beginning and end of each season. It should be observed that the calculations do not make any allowance for loss in weight during transit or from handling at shipment and at discharge, for the consequences of sea accidents, or for quantities consumed by crews and passengers. Thus, it happens that the actual shipments to non-European countries are certainly below the quantities indicated by the following calculations. It may however, be assumed that the shipment quantities which fail to reach their destination do not vary much from year to year, so that the procedure adopted may be adjudged generally as sufficiently exact.

The data forming the basis of this calculation are given below.

	1926-27	1927-28	1928-29	1929-30	1930-31
	Million centals.				
Aggregate exp'ts (including U.S.S.R.)	497	480	553	372	483
+ Quantity afloat at the beginning of the season .	23	28	27	48	34
— Quantity afloat at the end of the season	28	27	48	24	23
= Aggregate imports	492	481	532	396	484

	1926-27	1927-28	1928-29	1929-30	1930-31
— Quantity imported into European countries . . .	392	390	389	304	362
= Quantity imported by non-European countries . .	100	91	143	92	122
	Million bushels.				
Aggregate exp'ts (including U.S.S.R.)	826	800	921	621	804
+ Quantity afloat at the beginning of the season . .	39	46	45	80	39
— Quantity afloat at the end of the season	46	45	80	39	39
= Aggregate imports	819	801	886	662	804
— Quantity imported into European countries . . .	654	650	649	506	603
= Quantity imported by non-European countries . .	165	151	237	156	201

It should be noted that the quantity afloat on August 1, 1929, was really 26 million centals (43 million bushels) and not 48 (80). It has been considered opportune to make this modification in the above estimate because at the beginning of August 1929 large quantities of wheat exported to Europe and arrived there had not yet been recorded in the import statistics as at that period they were lying in free warehouses or had been admitted free of duty.

CEREALS

Germany : Generally cool and rainy weather in September not only retarded the completion of the cereal harvest, but also further reduced yields of the cereals still remaining on the fields.

Work preparatory to the winter sowings made only slow progress on damp lands.

Austria : The bad weather and rains of August continued during the whole of September which was, moreover, characterised by exceptional cold. At the end of September a large fall in temperature occurred, followed by heavy precipitation, which, in the mountains and on the highlands 600 metres above sea-level, fell on a layer of snow. In the high regions spring cereals suffered considerably from the rainy weather. At the end of September there was still, in places, some spring rye and wheat in the fields. Oats had not matured on the shady slopes of mountain regions. Threshing made good progress after the inclement weather which had disturbed the natural course of field work.

Work preparatory to the sowing of winter cereals was delayed by changeable weather in September. The sowings are consequently very backward, especially as heavy rains at the end of September and, in the highlands, snow, rendered them completely impossible. As regards winter cereals, wheat sowings were in the greatest delay, hav-

ing only commenced at the beginning of October. Winter rye is sprouting slowly, whereas barley has already sprouted and has suffered considerably from the cold.

Belgium : The beginning of September was rainy ; later, the weather turned finer with some sunny days at the end of the month. Temperatures were below the normal and some slight night frosts occurred.

Towards the end of September the first autumn cereal sowings were begun under fairly good conditions.

Bulgaria : The cereal harvest has been effected under very favourable conditions. Rains at the end of September and the beginning of October have been very favourable to the fields and winter sowings, which are continuing actively.

Spain : The course of the weather was not favourable to field work during the first half of October ; the long drought has rendered the preparation of the soil difficult and retarded the winter cereal sowings.

Estonia : Rainfall hindered winter cereal sowings in some places but in general growth is satisfactory.

Cutting was effected under rather favourable conditions ; average yields have been obtained but the quality of the product is good.

Irish Free State . The weather during the month of September was ideal for harvesting and all the cereal crops were saved in good order. Yields of grain were scarcely up to average, but the quality was dry and good and there was a good bulk of straw. No damage by storms, pests or diseases was reported.

Very little progress was made with autumn sowings, but some headway was made with the preparation of the land, soil and weather conditions being satisfactory. Such sowings as were made, were carried out under good conditions

France : Towards the middle of September the weather again turned fine and temperatures showed considerable improvement. ; these favourable conditions have permitted farmers to complete the operation of storing cereals without difficulty and to partly repair the considerable damage caused by previous bad weather.

Work preparatory to the sowing of winter cereals, began actively in good weather , it is expected that if the weather remains fine, cereal sowings may be made earlier than last season.

Great Britain and Northern Ireland : In England and Wales, except in the northern counties, where weather conditions were rather more favourable throughout September, the weather during the first part of the month was everywhere wet and unsuitable for field work. Later a general improvement took place. The cereal harvest, which had been carried out under unusually difficult conditions, was nearing completion at the end of the month, although in some areas a fair proportion remained to be carted. The excessive wet and lack of sunshine resulted in a good deal of cereals being harvested in damp and soft condition. Owing to the very protracted harvest, cultivation for autumn sowing is everywhere in arrear. Some progress was made in ploughing leys, but little cleaning was possible of fallow and stubbles which were rather dirty.

September weather in Scotland was dry and favourable for harvest, but there was an absence of drying winds. A portion of the grain crops has been secured in good order but some damage has been caused by heating in the stooks.

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Cereals.

COUNTRIES	(t) AREA				(t) PRODUCTION							
	1931	1930	Average 1925 to 1929	% 1931/32	1931	1930	Average 1925 to 1929	1931	1930	Average 1925 to 1929	% 1931/32	
	—	—	—	—	—	—	—	—	—	—	—	
	1931/32	1930/31	1925/26 to 1929/30	1930/ 1931 = 100	1931/32	1930/31	1925/26 to 1929/30	1931/32	1930/31	1925/26 to 1929/30	1930/ 1931 = 100	Aver.
	1,000 acres					1,000 centals			1,000 bushels			
WHEAT												
Germany	5,355	4,402	4,067	121.7	131.6	94,014	83,531	71,859	156,687	139,216	119,763	112.5 130.8
Austria	507	508	504	99.8	100.6	5,631	7,205	6,786	9,384	12,008	11,309	78.2 83.0
Belgium	306	411	375	96.3	105.5	9,153	7,942	8,879	15,255	13,236	14,799	115.8 103.1
Bulgaria	2,964	3,006	2,682	98.6	111.3	36,718	34,391	24,285	61,196	57,317	40,474	106.8 151.2
Spain	10,872	11,184	10,704	97.7	101.6	78,487	88,021	87,709	180,775	146,609	146,179	89.1 88.5
Estonia	38	90	66	—	—	384	981	605	640	1,635	1,009	—
Finland	47	51	43	92.7	110.0	653	726	601	1,139	1,210	1,002	94.1 113.7
France	12,494	12,990	13,123	96.2	95.2	—	138,673	174,815	—	231,118	291,353	—
Engl. and Wales	1,197	1,846	1,491	83.9	80.3	21,571	23,972	29,677	35,952	39,954	49,400	90.0 72.7
Scotland	51	54	56	94.6	91.8	—	1,277	1,322	—	2,128	2,203	—
Hungary	4,133	4,187	3,821	93.7	108.2	39,399	50,604	47,726	65,664	84,338	79,542	77.9 82.6
Italy	12,075	11,917	12,156	101.3	99.3	143,763	126,044	137,524	247,933	210,069	229,203	118.0 108.2
Latvia	215	179	139	120.2	154.3	2,101	2,439	1,330	3,502	4,066	2,299	86.1 152.8
Lithuania	495	526	352	94.2	140.9	5,133	6,796	3,647	8,555	11,327	6,279	75.5 140.7
Luxemburg	23	23	30	81.2	74.8	223	265	344	372	442	573	84.0 64.9
Malta	10	9	9	104.8	105.8	168	182	175	277	303	292	91.6 94.9
Norway	29	30	25	94.2	113.3	451	432	388	752	720	646	104.4 116.3
Netherlands	101	142	135	134.4	141.1	3,761	3,634	3,623	6,268	6,056	6,087	103.5 103.8
Poland	4,012	4,066	3,304	95.7	121.4	45,415	49,394	36,305	75,691	82,321	60,508	91.9 125.1
Rumania	8,365	7,551	7,746	110.8	108.0	76,721	78,404	63,319	127,808	130,770	105,530	97.8 121.2
Sweden	684	646	453	105.9	140.2	11,773	12,882	9,351	19,621	21,469	15,635	91.4 125.5
Switzerland (t)	179	180	171	99.6	104.6	3,365	3,461	3,357	5,941	5,769	5,595	103.0 106.2
Czechoslovakia	1,973	1,975	1,869	100.2	105.0	22,991	30,364	28,686	38,317	50,606	47,809	75.7 80.1
Yugoslavia	5,390	5,365	4,703	100.5	114.5	50,848	43,197	43,593	84,746	80,326	80,988	105.5 104.6
Total Europe	59,155	57,746	54,963	102.4	107.8	657,931	659,927	614,849	1,096,533	1,099,637	1,024,729	99.7 107.0
*U. S. S. R.	92,369	83,795	71,278	110.2	129.6	—	650,366	477,453	—	1,083,921	795,739	—
Canada	24,109	24,898	23,104	96.8	104.4	162,840	238,723	258,423	271,400	397,872	430,704	68.2 63.0
United States (w)	40,692	39,514	36,467	103.0	111.6	465,000	367,361	328,463	775,000	612,268	547,427	126.7 141.6
Mexico	1,424	1,216	1,281	117.1	113.0	6,487	6,563	6,456	15,778	11,446	10,760	137.8 146.8
Total North Amer.	53,229	56,624	51,852	96.0	101.7	702,707	763,649	755,363	1,171,178	1,272,437	1,263,873	92.7
China, Manchuria	3,920	3,413	2,731	114.3	143.5	85,037	30,515	27,101	58,394	50,857	45,167	114.8 129.3
*Korea	—	848	890	—	—	5,370	5,391	5,605	8,951	8,985	9,342	96.6 95.8
India	32,131	31,054	31,475	101.7	102.2	208,365	234,506	191,654	347,275	390,843	319,424	83.9 106.7
Japan	1,231	1,198	1,174	102.7	104.9	17,714	17,723	17,817	29,522	29,588	29,695	99.9 99.4
Syria and Lebanon	1,168	1,166	1,147	100.1	101.8	8,340	11,133	7,435	13,900	18,555	12,392	74.9 112.2
Total Asia	33,509	37,431	36,527	102.8	105.4	269,456	295,377	244,007	449,091	489,793	406,678	91.7 110.4
Algeria	3,535	3,980	3,654	93.8	96.3	13,223	19,350	17,790	22,046	32,249	29,649	68.4 74.4
*Cyrenaica	18	38	33	46.2	53.2	—	93	119	—	155	198	—
Egypt	1,619	1,522	1,554	103.4	106.1	27,643	23,652	24,300	46,071	39,763	40,049	115.9 115.0
*Eritrea	22	—	27	—	82.4	110	—	61	184	—	101	—
*Kenya (2)	60	71	57	84.5	105.3	—	389	353	—	648	597	—
French Morocco	2,732	2,957	2,632	92.4	103.8	20,825	12,782	18,553	34,708	21,302	27,588	162.9 125.8
Tripolitania	17	12	34	140.0	50.7	46	11	64	77	18	107	430.0 71.9
Tunis	1,903	1,923	1,719	99.0	110.7	8,157	6,239	7,068	13,585	10,989	11,780	120.7 115.4
Total Africa	9,336	10,394	9,593	94.6	102.5	69,399	62,234	65,055	116,497	103,720	109,173	112.3 106.7
*Argentina (4)	17,236	21,253	20,484	81.0	84.1	—	141,578	145,819	—	235,958	243,026	—
*Chile	1,426	1,610	1,602	88.6	80.0	—	12,714	17,255	—	21,190	22,758	—
Australia	13,500	18,212	12,797	74.1	105.5	—	127,959	81,605	—	218,266	136,006	—
Grand Totals	190,693	192,265	189,301	99.2	104.3	1,699,993	1,779,687	1,682,524	2,833,299	2,966,118	2,804,458	95.5 101.0
RYE												
Germany	10,789	11,642	11,014	92.7	92.9	154,053	189,297	167,462	275,095	302,317	299,040	91.0 92.0
Austria	904	927	946	97.5	95.5	10,260	11,556	11,257	18,322	20,636	20,102	88.8 91.1
Belgium	553	574	563	98.3	97.8	11,835	10,433	12,206	21,135	18,630	21,797	113.4 97.0
Bulgaria	537	657	481	90.8	124.3	6,759	7,067	4,104	12,070	12,820	7,329	95.6 164.7
Spain	1,544	1,551	1,717	99.5	89.9	10,367	12,064	13,354	18,512	21,544	23,847	85.9 77.6
Finland	350	387	354	97.0	100.4	3,144	4,975	3,325	5,615	8,885	5,937	63.2 94.6
France	554	558	565	99.6	98.0	6,724	7,893	7,013	12,007	14,104	12,522	85.1 95.9
*France	1,745	1,908	1,970	91.5	83.6	—	16,383	19,963	—	23,255	35,648	—
*Engl. and Wales	33	32	28	103.6	115.4	—	470	439	—	840	755	—

COUNTRIES	(t) AREA					(t) PRODUCTION							
	1931	1930	Average 1925 to 1929	1931 % 1931/32		1931	1930	Average 1925 to 1929	1931	1930	Average 1925 to 1929	1931 % 1931/32	
	—	—	—	—	—	—	—	—	—	—	—	—	—
	1931/32	1930/31	1925/26 to 1929/30	1930/31 1931 = 100	Aver.	1931/32	1930/31	1925/26 to 1929/30	1931/32	1930/31	1925/26 to 1929/30	1930/31 1931 = 100	Aver.
	1,000 acres					1,000 centals			1,000 bushels				
Hungary . . .	1,530	1,611	1,649	95.0	92.8	11,665	15,907	16,836	20,830	28,406	30,064	73.8	69.3
Italy	238	302	307	95.4	93.7	3,469	3,431	3,649	6,195	6,127	6,516	101.1	95.1
Latvia	571	660	627	86.6	91.0	3,133	8,051	5,228	5,595	14,377	9,335	38.9	59.0
Lithuania . . .	1,210	1,197	1,192	101.1	101.4	8,533	14,099	11,412	15,238	25,177	20,379	60.5	74.8
Luxemburg . . .	16	22	17	73.7	96.3	157	209	206	280	480	367	58.4	76.4
Norway	15	19	21	79.0	72.5	301	311	325	538	556	580	96.8	92.7
Netherlands . .	444	475	489	93.3	90.8	7,350	8,340	8,866	13,125	14,892	15,832	88.1	82.9
Poland	18,312	14,567	14,016	91.4	95.0	119,932	153,399	136,378	214,165	273,928	243,534	78.2	37.9
Rumania	1,063	968	720	109.3	147.7	8,819	10,241	5,971	15,747	18,288	10,662	86.1	147.7
Sweden	510	595	741	85.6	63.8	6,834	10,083	10,931	12,204	18,005	19,609	67.8	62.2
Switzerland . . .	46	49	49	92.5	93.5	800	831	912	1,429	1,484	1,629	96.3	87.7
Czechoslovakia .	2,493	2,599	2,535	95.9	98.4	28,279	39,409	37,015	50,498	70,374	66,099	71.8	76.4
Yugoslavia . . .	623	626	531	99.6	117.4	4,548	4,382	4,148	8,121	7,825	7,407	103.8	109.6
Total Europe . .	37,418	39,964	39,129	93.6	95.6	406,962	492,043	460,648	726,721	876,656	822,587	82.7	88.3
*U. S. S. R. . . .	70,086	27,233	66,620	97.0	105.2	..	..	489,038	..	..	873,285	..	..
Canada	983	1,448	794	67.9	123.8	4,243	12,330	7,245	7,570	22,018	12,087	34.4	58.6
United States . .	3,294	3,525	3,601	93.4	91.5	20,272	26,963	25,832	36,200	48,149	46,129	75.2	78.5
Total North Amer.	4,277	4,973	4,395	86.0	97.4	24,515	39,293	33,077	43,776	70,167	59,066	62.4	74.1
*Argentina (4) . .	1,334	1,322	901	101.0	148.1	..	2,646	3,352	..	4,724	5,986	..	..
*Chile	7	8	7	88.7	93.2	..	67	66	..	120	118	..	..
Grand Totals . .	41,695	44,937	43,534	92.8	95.8	431,477	531,336	493,725	770,491	948,822	881,653	81.9	87.4

BARLEY

Germany	4,001	3,753	3,692	106.6	108.4	68,181	63,058	63,172	137,879	131,373	131,611	105.0	104.8
Austria	422	430	371	98.1	118.8	5,119	5,893	5,237	10,065	12,278	10,911	86.9	97.7
Belgium	70	84	77	83.2	91.3	1,830	1,830	1,894	3,306	3,325	3,947	88.8	86.1
Bulgaria	608	602	562	87.8	108.2	7,948	9,637	5,858	16,558	19,860	12,204	83.3	135.7
Spain	4,465	4,543	4,456	98.3	100.2	43,261	49,883	44,786	90,129	108,926	93,305	86.7	96.6
Estonia	279	276	235	100.9	98.0	2,556	2,829	2,454	5,387	5,398	5,112	91.4	105.4
*Irish Free State .	115	116	131	99.0	87.9	..	2,648	3,001	..	5,517	6,253	..	..
Finland	276	272	271	101.4	101.7	3,144	2,987	3,086	6,550	6,223	6,429	105.3	101.0
*France	1,955	1,799	1,739	108.6	112.4	..	21,701	24,356	..	45,836	50,742	..	..
Engl. and Wales .	1,029	1,020	1,184	100.9	88.4	17,069	16,503	21,524	35,560	34,382	44,843	103.4	79.3
*Scotland	92	107	121	86.8	76.0	..	2,128	2,433	..	4,493	5,068	..	..
Hungary	1,136	1,131	1,054	104.8	112.3	9,277	13,250	13,118	19,322	27,605	27,390	70.0	70.7
Italy	530	583	577	90.8	91.8	5,289	5,377	5,416	11,020	11,202	11,285	98.4	97.7
Latvia	453	437	436	103.6	104.0	4,431	4,130	3,420	6,232	8,005	7,126	107.3	129.6
Lithuania	465	529	494	88.0	94.1	5,052	5,224	4,831	10,525	10,864	10,065	96.7	104.8
Luxemburg	9	7	8	116.1	101.9	100	99	112	208	206	233	100.9	89.1
Malta (3)	7	7	6	101.4	106.0	137	142	138	235	235	228	98.8	93.0
Norway	138	134	143	102.3	97.1	2,257	2,362	2,366	4,703	4,922	4,929	95.6	95.4
Netherlands . . .	70	76	71	92.8	99.3	1,764	1,939	1,916	3,674	4,040	3,992	91.0	92.0
Poland	3,111	3,048	2,841	102.1	109.5	33,280	32,274	30,767	69,355	67,288	64,099	103.1	108.2
Rumania	4,769	4,881	4,360	97.7	109.4	33,731	52,279	36,223	70,274	108,916	75,487	94.5	93.1
Sweden	313	326	348	96.0	90.0	4,828	5,290	5,719	10,069	11,021	11,916	91.3	84.4
Switzerland . . .	18	18	16	109.2	110.1	295	238	267	615	496	556	124.1	110.7
Czechoslovakia .	1,759	1,673	1,766	105.1	99.6	21,813	28,348	28,597	45,446	55,934	59,579	81.2	78.3
Yugoslavia . . . *	1,179	1,133	976	97.6	113.3	8,184	8,915	8,342	17,051	18,674	17,379	91.8	98.1
Total Europe . .	25,157	25,051	23,974	100.4	104.9	277,336	310,893	289,253	577,889	647,707	602,626	89.2	95.9
*U. S. S. R. . . .	17,070	18,417	17,724	92.7	96.3	..	..	124,687	..	..	299,770	..	..
Canada	4,075	5,559	4,297	73.3	94.8	34,808	64,877	50,183	72,516	135,160	104,550	53.7	69.4
United States . .	12,771	12,901	10,222	99.0	124.9	103,680	160,786	127,201	216,000	334,971	205,006	64.5	81.5
Total North Amer.	16,846	18,460	14,519	91.3	116.0	138,488	225,663	177,384	288,516	470,131	369,556	61.4	73.1
*Korea . . . . .	..	2,382	2,209	..	..	19,621	19,127	17,666	40,377	39,849	36,805	102.6	111.1
Japan	2,105	2,110	2,336	99.8	90.1	35,040	34,786	40,696	73,001	72,472	84,785	100.7	86.1
Syria and Lebanon	941	831	706	113.3	133.4	6,688	10,858	6,746	13,371	22,621	14,055	61.3	98.7
Total Asia . . .	3,046	2,941	3,042	103.6	100.2	41,688	45,644	47,442	86,872	95,093	98,840	91.4	87.9

COUNTRIES	(t) AREA					(t) PRODUCTION							
	1931	1930	Average 1925 to 1929	% 1931 1931/32		1931	1930	Average 1925 to 1929	1931	1930	Average 1925 to 1929	% 1931 1931/32	
	—	—	—	—	—	—	—	—	—	—	—	—	—
	1931/32	1930/31	1925/26 to 1929/30	1930/ 1931 = 100	Aver.	1931/32	1930/31	1925/26 to 1929/30	1931/32	1930/31	1925/26 to 1929/30	1930/ 1931 = 100	Aver.
	1,000 acres = 100					1,000 centals					1,000 bushels = 100		
Algeria	3,199	3,650	3,445	87.6	92.8	11,244	18,327	16,661	23,425	38,183	34,712	61.3	67.5
*Cyrenaica	82	127	133	64.5	61.3	—	276	772	—	574	1,609	—	—
Egypt	306	345	368	88.7	83.0	4,653	5,043	5,440	9,993	10,506	11,334	92.3	85.5
*Eritrea	62	—	58	—	105.9	—	320	166	666	—	846	—	192.8
French Morocco	3,156	3,207	3,028	98.4	104.2	24,643	17,995	21,933	51,341	37,491	45,695	136.9	112.4
Tripolitania	90	124	274	80.0	36.0	265	165	609	551	344	1,268	160.0	43.5
Tunis	1,057	1,202	1,243	90.4	87.5	3,968	2,646	4,195	8,268	5,512	8,741	150.0	94.6
Total Africa	7,447	8,525	8,555	92.0	93.9	44,771	44,176	45,825	92,278	92,636	101,750	101.3	91.7
*Argentina (4)	1,458	1,422	1,171	102.5	124.5	—	6,834	7,961	—	14,288	16,587	—	—
*Chili	144	166	173	86.9	83.4	—	1,860	2,681	—	3,576	5,585	—	—
Grand Totals	52,896	54,980	49,893	96.2	106.0	502,340	626,376	562,917	1,046,565	1,304,967	1,172,772	80.2	89.2
OATS													
Germany	8,309	8,499	8,040	97.8	96.2	141,035	124,702	143,893	440,730	389,660	449,064	118.1	98.0
Austria	720	772	757	93.8	95.2	7,346	8,834	9,591	22,950	27,006	29,972	83.2	76.6
Belgium	728	674	678	107.9	107.3	12,956	12,231	15,318	40,531	38,223	47,669	106.2	84.8
Bulgaria	294	345	338	85.2	67.1	2,754	2,437	2,332	8,605	7,616	7,287	113.0	115.1
Spain	1,693	1,940	1,873	87.3	90.4	13,662	15,999	12,913	42,380	49,995	40,854	84.8	105.0
Estonia	367	368	357	99.6	102.7	3,254	3,478	2,670	10,170	10,870	8,343	93.6	121.9
*Irish Free State	628	644	656	97.5	95.8	—	14,160	14,410	—	44,250	45,000	—	—
Finland	1,149	1,137	1,110	101.1	103.5	14,176	13,267	12,938	44,299	41,458	40,415	106.9	100.6
*France	8,032	8,533	8,823	100.6	100.1	—	96,880	111,902	—	302,749	349,690	—	—
Engl. and Wales	1,852	1,778	1,820	92.9	90.8	27,754	30,036	32,202	58,730	93,563	100,832	92.4	86.2
*Scotland	846	862	906	98.2	93.4	—	14,493	15,882	—	45,290	49,690	—	—
Hungary	612	608	637	100.7	89.1	3,499	5,760	8,235	10,934	17,999	25,734	60.7	42.5
Italy	1,222	1,262	1,243	96.9	98.3	13,331	11,785	13,793	41,658	36,828	43,103	113.1	96.6
Latvia	795	790	740	100.6	107.5	7,582	7,532	5,480	24,031	23,337	17,124	104.6	143.8
Lithuania	851	855	829	99.5	102.7	8,531	8,599	6,846	26,815	26,371	21,394	99.8	125.3
Luxemburg	70	70	72	100.0	97.6	880	880	671	2,749	2,750	3,035	100.0	10.6
Norway	237	239	241	99.0	98.2	3,339	4,359	4,024	10,433	13,621	12,574	76.6	83.0
Netherlands	366	370	377	99.0	97.1	6,067	6,545	7,332	18,960	20,454	22,913	92.7	82.7
Poland	5,465	5,404	5,007	101.1	109.1	55,116	51,756	51,251	172,235	161,738	180,159	106.5	107.5
Rumania	2,175	2,686	2,806	81.0	77.5	17,858	25,497	22,518	55,804	79,679	70,398	70.0	79.3
Sweden	1,589	1,629	1,703	97.5	90.1	21,539	25,299	26,111	67,310	79,058	81,595	85.1	82.5
Switzerland	45	48	50	93.9	90.6	851	851	923	2,659	2,659	2,900	100.0	91.7
Czechoslovakia	2,116	2,049	2,078	103.3	101.9	26,526	28,833	30,997	82,893	90,101	96,865	92.0	85.6
Yugoslavia	979	1,037	936	94.4	104.6	6,111	6,283	7,548	19,098	19,634	23,586	97.3	81.6
Total Europe	31,434	32,560	32,401	96.5	97.0	394,447	394,963	417,886	1,232,630	1,234,250	1,305,886	99.9	94.4
*U. S. S. R. . . .	12,497	14,287	11,262	96.0	103.0	—	—	326,462	—	—	1,020,185	—	—
Canada	13,650	13,259	12,831	103.0	106.4	115,389	143,870	133,308	360,591	449,595	418,583	80.2	86.6
United States	41,248	40,125	42,554	102.8	96.9	375,680	434,577	421,423	1,174,000	1,358,052	1,316,953	86.4	89.1
Total North Amer. . . .	54,898	53,384	55,385	102.8	99.1	491,069	578,447	554,736	1,534,591	1,807,647	1,733,536	84.9	88.5
Syria and Lebanon	27	28	41	96.5	66.8	215	175	282	670	547	880	122.5	76.2
Algeria	542	638	605	84.9	89.6	2,601	5,300	4,118	8,180	16,581	12,869	49.1	63.2
French Morocco	73	103	71	71.6	103.9	755	754	559	2,359	2,357	1,747	100.1	135.0
Tunis	99	124	104	79.6	94.7	1,036	661	825	3,238	2,067	2,577	156.7	125.7
Total Africa	714	865	780	82.6	91.5	4,392	6,715	5,502	13,727	20,985	17,193	65.4	70.8
*Argentina (4)	3,504	3,937	3,387	89.0	103.5	—	15,873	21,273	—	49,604	66,493	—	—
*Chili	156	193	193	81.0	80.9	—	1,635	2,199	—	5,109	6,870	—	—
Grand Totals	87,013	86,837	83,607	100.3	98.3	890,123	980,300	978,406	2,781,618	3,063,429	3,057,495	90.8	91.0

(t) The two dates mentioned refer to the years in which the harvest took place in the northern and southern hemispheres respectively. — * Countries not included in the totals. — s) Autumn crops. — t) Spring crops. — (1) Including spelt and meslin. — (2) European crops only. — (3) Barley and meslin. — (4) Area sown.

In Northern Ireland weather during the past month continued fine and mild apart from heavy showers locally and conditions remained favourable for farm operations although there was an absence of sunshine and drying winds which were needed for the cereal harvest. Short, cold spells marked the beginning and the middle of September but day temperatures were, as a rule, high for the time of the year. Severe ground frosts prevailed at night towards the end of the month and were generally succeeded by heavy morning dews.

The bulk of the wheat crop has been harvested in good condition. Very little threshing has been done so far. It is reported that the crop on the whole is of fair quality but that the grain is in soft condition in many cases. The yield may not reach the average as some crops were thin. The major portion of the oat crop has been stacked. The humid atmosphere experienced on many days last month retarded normal seasoning of the sheaves in stock with the result that in many cases stacking was carried out too soon and "heating" resulted. Variable reports are to hand regarding probable yields. In some districts the yield will be disappointing. The quality of the grain is on the whole fair, but some samples now being threshed are in a soft condition. Cutting of the barley crop was practically completed by the end of September but a large portion still remained in stocks at that time. This crop is of fair quality on the whole.

Hungary : During the three weeks from September 16 to October 7, the weather was characterised by relatively low temperatures and over most of the country by abundant and frequent rains. Threshing of cereals has been completed everywhere. On the basis of threshing results for cereals, on the large farms, a new crop estimate has been made giving slightly higher figures for all cereals than those estimated on August 26. On October 9 winter cereal sowings were in full swing. In different regions, some winter barley and rye had sprouted; at the same period rains favoured field work and the sowings.

Italy : During September fairly frequent rains fell in northern and central Italy but precipitation was rare in southern and central areas. Seasonal conditions were especially variable in the latter half of the month with scattered rains. Work preparatory to the sowings began actively but is now continuing at normal speed.

Latvia : In September temperatures were rather low, and towards the end of the month the cold became more intense with severe night frosts.

According to correspondents' reports, the quality of winter cereals was average in 23.8 % of the cases, above the average in 3.9 % and below it in 72.3 %.

Lithuania : Frequent rains have hindered the cereal harvest; only rye has been harvested under good conditions. The cereals have been stored later than usual.

Area this year is 300,000 acres, an increase of 13.9 % on that of last year (263,000 acres) and an increase of 25.1 % on the average of the five years ending 1929 (239,500 acres).

Production this year is 3,538,000 centals (6,100,000 bushels) an increase of 21.3 % on that of last year (2,916,000 centals or 5,028,000 bushels) and an increase of 57.5 % on the average of the five years ending 1929 (2,247,000 centals or 3,874,000 bushels).

Winter cereal sowings, which had been hindered by continual rains, began towards September 15.

Norway : Area this year is 13,500 acres, a decrease of 14 % on that of last year (13,700 acres) and a decrease of 19.7 % on the average of the five years ending 1925-29 (16,800 acres).

Production this year is 219,000 centals (377,000 bushels) a decrease of 14.2 % on that of last year (255,000 centals or 440,000 bushels) and a decrease of 26.3 % on the average of the five years ending 1925-29 (297,000 centals or 511,000 bushels).

Netherlands : As the law relating to the baking of bread has made compulsory the mixture of home wheat flour with that imported it is logical that the wheat area should much larger than in previous years ; in bread making, quality is assuming a greater importance than usual. Due to the cool and rainy weather it is decidedly inferior to that of past years and in general little better than mediocre.

The oat crop has in some cases turned out to be better than that of wheat but for this cereal also, yields are below the level forecasted.

Rumania : During the latter half of September the average temperature fell sharply. Over most of the country the minimum temperature is below 0°C. Atmospheric precipitation has been very abundant, especially in Transylvania. Preparation of the fields for cereal sowings continued everywhere at the beginning of October. The acreage sown to winter cereals is so far of limited extent.

Czechoslovakia : The cold and rainy weather at the end of August continued in September and did not improve until towards the end of the month.

Cereals have been damaged by the persistent rains, especially in the higher regions, where they were still in stocks and began to germinate and rot. In some areas rye at the end of the month was still in the fields as it had not been possible to cart it. In lower-lying areas oats have been gathered in rather wet state.

Incessant rains have similarly hindered the work of preparation for the sowings which are about three weeks behind.

Yugoslavia : After the abundant and frequent rains in the latter half of September, the weather improved at the beginning of October but remained cool. These weather conditions were very favourable to preparatory work and winter sowings.

U. S. S. R. : During September considerable fluctuations in temperature occurred together with rather light but relatively frequent rainfall, principally in the western and northeastern parts of the European territory of the Union.

According to the Commissariat for Agriculture, on October 5 straw cereals had been harvested on 241,806,000 acres, or 95 % of the total area. The area not yet harvested was situated chiefly in Siberia and in some northern regions of the European part of the Union.

On October 5, about 48 % of the cereals harvested had been threshed.

The area sown to winter cereals, almost entirely rye and wheat had, on October 10, reached 79,722,000 acres, or 79.7 % of that planned and 102.7 % of the acreage sown at the same date of last year.

The autumn work of preparing the soil for spring sowings had, by October 10, been accomplished on an area of 42,910,000 acres or 41.3 % of that forecast in the plan.

During September the plan of cereal purchases by the State and the various organisations charged with this task had been carried out to the extent of only 68.2 % of the quantities fixed for that month. The normal plan of purchases up to October 1 had been carried out to the extent of 43.4 %.

The progress of cereal purchases in the first quarter of the July-September season is judged to be unsatisfactory in the Ukraine, in the North Caucasus, in the Lower and Middle Volga regions, in the central Black Earth region and in eastern and western Si-

beria although purchases in the present year have exceeded those of the same quarter of 1930.

September weather conditions in the southern and central regions of the Union were favourable for the purchasing season

Argentina : The second estimates of the areas sown to cereals, apart from small differences, confirm the data published in September. By Decree at the end of August, the Ministry of Agriculture has provided for the distribution on credit to farmers for exclusive use as seed, of 2,000 metric tons of wheat and 1,500 of linseed, appropriating for this purpose 400,000 paper pesos on the security of the crop when produced. According to official information, farmers have generally used "pedigree" seed, as it gives higher yields. Rains in the last few days of August and the first half of September have favoured the growth of all cereals, only in the area south of Buenos Aires have a few local frosts caused slight damage to the sowings. Mild temperatures are required for complete growth. Partial attacks of locusts are reported in the provinces of Cordoba, Catamarca, Santiago del Estero, San Luis, Tucumán and in the Chaco. Considerable damage has been caused, particularly in the Chaco and in the adjacent area of North Santa Fé. The Ministry of Agriculture, through the regional agricultural offices, is taking a series of energetic measures to control them in the typically agricultural area of the country.

(Telegram of October 17) · Crop condition of cereals is good. Weather conditions have favoured their growth. Germination has taken place regularly and uniformly and no important damage is reported.

Canada. (Saskatchewan): According to the Saskatchewan Department of Agriculture, nearly half of the wheat had been threshed by about September 20th. Only a small amount of coarse grains had been threshed, although it was difficult to estimate the amount due to the unusually large acreage which will not be threshed but used as green feed. Due to recent rains, several good drying days were needed to allow the resumption of threshing. Previous to the rainy weather, most of the wheat was grading one or two Northern. Very little fall ploughing has been done even in those districts where this practice is generally followed.

According to a report dated October 5 received from the Saskatchewan Department of Agriculture, threshing had made slow progress. About 63 % of the wheat produced in the Province had been threshing and possibly half of the coarse grains. It was stated that much of the unthreshed wheat would suffer a loss of one grade due to bleaching and in a few cases, sprouting. Only a small amount of fall ploughing had been done.

United States : In the week ended on September 24 conditions were favourable for the sowing of winter cereals, especially in the Northwest, where precipitation was general. In the last week of September sowing progressed slowly due to the scantiness of rainfall. The soil was still too dry in the Southwest and in much of the Great Plains area from Nebraska southwards; in Texas the seed already sown could not germinate. Ploughing and seeding were favoured in the Northwest, including the Northern Great Plains and also in the Ohio valley and adjacent sections. At the end of the second week of October sowing was still backward in some parts owing to scanty rain.

Palestine : Cultivation of autumn sowings started under average conditions. Weather is normal.

Syria and Lebanon : The wheat crop is deficient due to rust and shrinkage caused by heat at the ear formation stage. The crop harvested is partly unfit for consumption or use as seed.

Algeria : The course of the season has been definitely favourable for field work and for the sowings, which will be finished rapidly if the weather continues propitious ; rainfall at the beginning of the month has assured the necessary soil moisture.

Cyrenaica : In the plain south of Bengasi, where nearly all the cereals are produced, the crops have all failed.

Kenya : August weather was very variable in different districts, being dry in some and moderately or excessively rainy in others. In the areas favoured most by the weather, wheat harvesting was in progress. Locusts have continued to damage crops in most districts, making any estimate of probable yields more difficult. It is not yet possible to make a trustworthy estimate but it is hoped next month to furnish a preliminary estimate of the wheat crop

French Morocco : Winter cereal sowings have not yet begun owing to the lack of rain.

Tripolitania : Work for the wheat and barley sowings has been carried out under good conditions

Tunis : In the North of the country weather conditions have been in general favourable to cereal crops and yields have been above the average, except in some localities where damage has been caused by excessive moisture, rust and insects. In the Centre and South, cereal production was poor as a consequence of the persistent drought.

Abundant and general rains permitted, after the middle of September, a favourable beginning of the work of preparation for the sowings, even where soil conditions were not propitious

Union of South Africa : Reports on the conditions of the winter cereal crops are generally favourable. Although further rains in September will be necessary in the dry-land farming areas to see the crops through, the general condition is high and no reports of serious infestation of insect pests or rust have so far been received. Severe frosts and stormy weather at the end of the month, however, caused some damage to advanced stands in the southeastern Free State and western Transvaal.

Australia : According to a telegram of October 16th received from the Australian Government, the weather has been generally very favourable to crops in South Australia and Western Australia, their aspect being favourable. In New South Wales and Victoria rainfall has been unsatisfactory but crop condition is fairly satisfactory. This year's yield is expected to be larger than the average of the previous five years (about 93.4 million centals or 156 million bushels).

MAIZE

The data received by the Institute up to the middle of October permit a more precise estimate of the volume of the maize crop in those countries of the northern hemisphere whose production is of considerable commercial importance.

The crop of the United States, which is the largest producer of maize in the world, is, on the basis of the latest estimate, rather less than 1,500 million centals (2,760 million bushels), or at about the same level as the 1926 crop. Harvesting operations were effected under generally satisfactory conditions and ripening took place before the frosts could jeopardize the quantity and quality of the grain.

The result of the European crop is now known to be satisfactory in Rumania, Yugoslavia and Bulgaria, whereas it is very poor in Hungary and in all the other producing countries that import maize for which data of production are at present known. Compared with the average production of the five-year period 1925-29 Italy, which occupies third place among the large European producing countries records a diminution of 21.5 % (early variety) and Hungary of 17.3 %.

Hungary, which is normally an exporting country, is expected to have a net import as in the current season; in the ten months 1 November 1930 to 31 August 1931 only 236,000 centals (421,000 bushels) was exported while 2,127,000 (2,799,000) was imported.

*Production and exports of maize of the principal exporting countries
of the northern hemisphere during the period 1925-1931.*

YEAR	Country	Production of the first year indicated	Exports in the season 1 November-31 October				
			In the 10 months after harvest (1 Nov-31 August)		In the 12 months after harvest (1 Nov-31 Oct)		Monthly average
			Absolute figures	% Total export = 100	Absolute figures	% Prod = 100	
Thousand centals							
1931-32 . .	Danubian countries(r)	257,904	..	..	...	...	...
	United States	1,513,080	.	...	...	...	...
1930-31 . .	Danubian countries(r)	224,138	(2) 24,291	...	...	..	...
	United States	1,172,389	1,168	.	...	...	...
1929-30 . .	Danubian countries(r)	292,510	44,355	92.8	47,801	16.3	3,984
	United States	1,463,910	3,993	92.8	4,303	0.3	359
1928-29 . .	Danubian countries(r)	162,043	4,101	78.5	5,337	3.3	445
	United States	1,578,579	21,985	97.0	22,670	1.4	1,889
1927-28 . .	Danubian countries(r)	174,386	18,215	99.7	18,279	10.5	1,523
	United States	1,547,326	10,340	93.2	11,098	0.7	924
1926-27 . .	Danubian countries(r)	262,086	47,289	95.7	49,399	18.8	4,116
	United States	1,507,636	7,987	93.4	8,552	0.6	712
1925-26 . .	Danubian countries(r)	238,989	39,092	96.0	40,706	17.0	3,393
	United States	1,633,492	12,132	91.2	13,309	0.8	1,109
Thousand bushels							
1931-32 . . .	Danubian countries(r)	460,544	...	...	...	...	...
	United States	2,703,000	...	...	...	..	...
1930-31 . . .	Danubian countries(r)	400,246	(2) 43,376	...	...	...	...
	United States	2,093,552	2,087	...	...	...	...
1929-30 . . .	Danubian countries(r)	522,341	79,205	92.8	85,359	16.3	7,114
	United States	2,614,131	7,130	92.8	7,685	0.3	642
1928-29 . . .	Danubian countries(r)	289,362	7,484	78.5	9,531	3.3	795
	United States	2,818,899	39,258	97.0	40,483	1.4	3,374
1927-28 . . .	Danubian countries(r)	311,405	32,526	99.7	32,640	10.5	2,720
	United States	2,768,090	18,464	93.2	19,818	0.7	1,650
1926-27 . . .	Danubian countries(r)	468,013	84,445	95.7	88,213	18.8	7,350
	United States	2,692,215	14,263	93.4	15,271	0.6	1,272
1925-26 . . .	Danubian countries(r)	426,766	69,808	96.0	72,690	17.0	6,059
	United States	2,916,958	21,664	91.2	23,767	0.8	1,980

(1) Rumania, Yugoslavia, Hungary and Bulgaria. — (2) 9 months.

The smallness of fodder production in this country is arousing the deep anxiety of livestock farmers and government bodies; in face of the danger of a shortage, tariff and freight adjustments are being favoured to facilitate the import of the necessary fodder supplies — including maize — and to check export.

The total production of the Danubian group of countries (including also Hungary) amounts to 258 million centals (461 million bushels) or nearly the same quantity as crop of 1926 (262 million centals or 468 million bushels), which permitted this group of countries to export, in the following twelve months, the record quantity of 49 million centals (88 million bushels). In estimating their possible exports, however, it should not be forgotten that home consumption, and therefore the exportable quantity of maize — depends to a large extent on the abundance of the other cereals and the relation between their prices and maize prices and also that the quantities held by peasant farmers from one crop to another vary greatly from year to year.

The United States, in the twelve months following the 1926 crop (approximately equal to that of this year) exported 86 million centals (15.3 million bushels). It must be borne in mind, however, that the production of that year was preceded by the very large crop of 1925 (1,633 million centals or 2,917 million bushels), while the present crop follows the very small one of 1930 (1,172 million centals or 2,094 million bushels). In the first ten months of the present season (1 November 1930 to 31 August 1931) the United States exported 1,168,000 centals (2,087,000 bushels) and imported 509,000 centals (909,000 bushels) and consequently was practically absent from the world maize market. The country adjusted its home consumption to the supplies, much below the normal, offered by the small home production of maize during the year, and used extensively for the feeding of livestock other cereals, of which there existed an abundance at prices no higher than those quoted for maize. Taking account of these considerations and of the elasticity of maize consumption in the United States, it is justifiable, notwithstanding the much larger crop obtained than last year, to forecast also for the ensuing commercial season only a small export, especially as the production of other fodder cereals has not been abundant.

Production and exports of maize of Argentina during the period 1925-1931.

YEAR	Production of the first year indicated	Exports in the season 1 March-30 April						Monthly average
		In the 4 months after harvest (1 May-31 August)		In the 6 months after harvest (1 May-31 Oct.)		In the 12 months after harvest (1 May-30 April)		
		Absolute figures	% Total export = 100	Absolute figures	% Total export = 100	Absolute figures	% Prod. = 100	
Thousand centals								
1931-32. .	208,653	81,851	...	55,991	45.2	123,801	78.8	10,318
1930-31. .	157,146	33,316	26.9	71,814	64.0	112,154	86.4	9,345
1929-30. .	129,756	52,481	46.8	98,582	70.2	140,490	82.1	11,707
1928-29. .	171,190	72,016	51.3	109,489	67.9	161,357	89.8	13,446
1927-28. .	179,677	77,938	48.3	63,947	47.4	135,029	75.0	11,252
1926-27. .	180,118	38,517	28.5	47,669	60.5	78,829	75.6	6,570
1925-26. .	104,328	33,777	42.8					
Thousand bushels								
1931-32. .	372,595	146,163	...	99,984	45.2	221,074	78.8	18,424
1930-31. .	280,619	59,494	26.9	122,239	61.0	200,275	86.4	16,688
1929-30. .	231,707	93,717	46.8	176,040	70.2	250,876	82.1	20,905
1928-29. .	305,696	128,601	51.3	195,516	67.9	288,138	89.8	24,011
1927-28. .	320,853	139,176	48.3	114,192	47.4	241,124	75.0	20,094
1926-27. .	321,641	68,781	28.5	85,123	60.5	140,766	75.6	11,732
1925-26. .	186,300	60,316	42.8					

In estimating the possibilities of disposing of the surpluses existing in the exporting centres of the northern hemisphere, the supply situation in Argentina, which is the largest exporter in the world, must not be overlooked. The statistics of this country confirm the record production of last spring at the figure of 208 7 million centals (372.6 million bushels) a quantity which, taking account of a home consumption estimated at about 46 million centals or 83 million bushels, corresponds to an exportable quantity of over 160 million centals or 290 million bushels on May 1.

Owing to the subsequent heavy exports this supply was, according to a recent communication of the Ministry of Agriculture reduced by October 12, to about 53 million centals (94 million bushels). Supposing that exports continue during the remainder of this month at the same rate as during the last few weeks, supplies in Argentina at the end of October should not exceed 45 million centals (80 million bushels). If to this quantity is added about 45 million centals (80 million bushels) exportable from the centres of the northern hemisphere, it may be calculated that there exist, to meet world import requirements until the new crop in Argentina, about 90 million centals (160 million bushels).

In relation to the statistics for the last six seasons, such a quantity appears to be normal at this period of the year. The net imports of the 19 most important importing

Net imports of maize in the 19 principal importing countries.

SEASON	Producing and importing countries 1)			Countries exclusively importing 2)			Totals			
	Quarter Nov. to Jan.	Quarter Feb. to April	Half-year Nov. to April	Quarter Nov. to Jan.	Quarter Feb. to April	Half-year Nov. to April	Quarter Nov. to Jan.	Quarter Feb. to April	Half-year Nov. to April	12 months to Oct.
Million centals										
1930-31	18	15	33	34	27	61	52	42	94	...
1929-30	18	14	32	29	23	52	47	37	84	165
1928-29	23	14	37	27	20	47	50	34	84	165
1927-28	16	13	29	42	32	74	53	45	103	205
1926-27	15	15	30	35	40	75	50	55	105	231
1925-26	17	13	30	28	23	51	45	36	81	156
Million bushels										
1930-31	31	27	58	61	49	110	92	76	168	...
1929-30	32	24	56	52	41	93	84	65	149	294
1928-29	41	25	66	48	35	83	89	60	149	295
1927-28	29	24	53	76	57	133	105	81	186	367
1926-27	27	27	54	63	72	135	90	99	189	412
1925-26	30	24	54	51	41	92	81	65	146	278

1) Italy, France, Spain, Czechoslovakia, Portugal, Greece, Austria, Poland, Switzerland, Canada and Japan. —

2) Great Britain and Northern Ireland, the Netherlands, Germany, Belgium, Denmark, Irish Free State, Norway and Sweden.

countries of the world, which absorb over 95 % of the world imports of maize, have, in fact, fluctuated in the half year November-April, between 80.9 million centals (144.5 million bushels) and 105.4 million centals (188.2 million bushels) and on the average have exceeded 93 million centals (165 million bushels). The total exportable supplies on November 1, including also those of the minor exporting countries, will very probably equal the average, so that for the first half of the coming season, that is until the new crop in Argentina, a healthy equilibrium between supply and demand may be anticipated.

V. DE.

* * *

Germany : The area for grain production this year is 5,600 acres, an increase of 41 % on that of last year (5,380 acres) and an increase of 23 % on the average of 1927-29 (5,470 acres)

Austria : The ripening of maize was hindered by rainy and cold weather in September. Until the end of September it was possible to begin cutting only in the warmer regions. Smut (*ustilago maydis*) had not spread much, but there were scattered complaints of considerable frost damage.

Crop condition on 1st October was estimated at 2.5 as at the beginning of the preceding month and 2.4 on 1st October last year.

France : In the most important producing regions, harvesting was in progress at the beginning of October, production is considered to be satisfactory but precise news on yield and quality of the grain is still lacking.

Italy : The maize harvest, which was about finished in September, confirms a poor product. In some areas, early maize was thin and ripened late.

Maize.

COUNTRIES	AREA				PRODUCTION								
	1931	1930	Average 1925 to 1929	% 1931	1931	1930	Average 1925 to 1929	1931	1930	Average 1925 to 1929	% 1931	1930	Average = 100
			1,000 acres				= 100			= 100	1,000 centals			1,000 bushels of 56 lbs		= 100	= 100
Austria . . .	148	143	146	103.0	101.7	2,659	2,663	2,490	4,748	4,756	4,447	99.8	106.8
Bulgaria . . .	1,675	1,639	1,671	99.2	100.2	21,932	17,088	14,713	39,254	30,515	26,274	123.6	149.4
Spain	1,115	1,106	1,057	100.9	105.5	13,119	16,152	13,144	23,423	28,844	23,471	81.2	99.8
Hungary . . .	2,735	2,605	2,602	105.0	102.8	32,699	31,021	39,540	53,391	55,394	70,618	105.4	82.7
Italy . . .) s)	3,423	3,486	3,541	98.2	96.6	40,643	63,181	51,754	72,578	112,735	92,418	64.4	78.5
Italy . . .) t)	235	255	218	92.2	107.8		2,899	2,013		5,176	3,595		
Rumania . . .	11,486	10,939	10,606	105.0	108.3	132,278	99,648	99,979	236,211	177,942	178,534	132.7	132.3
Switzerland . .	3	3	3	79.2	76.4	66	64	84	118	114	150	103.4	78.5
Czechoslov. . .	368	364	344	101.2	107.0	4,899	5,479	5,363	8,748	9,783	9,577	89.4	91.3
Yugoslavia. . .	6,158	6,097	5,575	101.0	110.5	70,945	76,381	67,356	123,688	136,395	120,279	92.9	105.3
—													
*U. S. S. R. . .	9,742	9,634	8,386	100.6	116.2	..	..	79,114	..	..	141,275	..	..
—													
*Canada . . .	164	161	174	101.9	94.1	..	3,263	3,703	..	5,828	6,613	..	..
United States .	105,557	101,413	99,570	104.1	106.0	1,513,080	1,172,389	1,546,016	2,703,000	2,036,552	2,760,751	123.1	97.9
China:													
Manchuria . .	2,441	2,139	2,469	114.1	98.9	37,754	35,030	37,348	67,418	62,554	67,586	107.8	99.8
Syria and Leb. .	65	61	121	107.3	54.0	562	600	1,370	1,004	1,071	2,446	93.7	41.0
—													
Algeria	20	24	25	81.5	79.7	127	164	144	226	292	257	77.4	88.3
Entrea	22	22	13	100.0	166.7	132	198	79	236	364	142	66.7	166.7
*Kenya (1) . .	200	206	201	97.1	99.8	..	3,299	2,475	..	5,392	4,420	..	..
Fr. Morocco . .	837	649	561	129.0	149.3	2,080	3,354	2,973	3,715	5,990	5,309	62.0	70.0
Tunis (2) . . .	44	37	45	119.0	99.2	110	132	108	197	236	192	83.3	102.5
Grand Total . .	136,097	139,777	128,409	104.1	106.0	1,873,735	1,523,494	1,882,967	3,345,960	2,799,537	3,362,451	123.9	99.5

* Countries not included in the totals. — s) Early crop. — t) Late crop. — 1) European crop. — 2) Maize and sorghum.

Hungary : At the end of the first ten days of October the maize harvest was finished almost everywhere and cutting of the stalks had begun.

Owing to the great summer drought, the formation of ears and grain was unsatisfactory. The subsequent rains have improved only the situation of the late varieties.

Rumana : At the beginning of October, the maize harvest was nearly finished in the plain Departments and was proceeding fairly slowly in the highlands. In Transylvania the crop was checked by too heavy rains during September. The sharp fall in temperature in the last ten days of September checked the growth of late varieties which, however, represent only a very small part of the maize area. Generally maize production corresponds to the previous estimates and may be considered to be very good as regards both quality and quantity.

Yugoslavia : Abundant rain in the latter half of September did no damage to the maize crop which is drying slowly due to the damp weather.

U. S. S. R. : On October 5 harvesting of maize had been effected on an area representing 17 % of the total maize area sown this year.

United States : Persistently warm weather during most of September brought the maize crop to remarkably rapid maturity and at the end of the month the crop was practically all safe from frost. In the last week of the month however, dampness was rather unfavourable for drying, especially in the Upper Mississippi valley, but at the close of the week the weather was fair and cooler. Some husking was done in the northern portions of the belt ; a little test husking in Iowa was reported as disappointing. In the second week of October harvesting was proceeding in good conditions.

Mexico : Yields in the North and Centre are considered to be good.

Palestine : Harvesting of maize is finished, except in the Huleh area, where the second crop is ripening off.

Egypt : Crop condition of maize on 1st October was estimated at 98, against 100 at the beginning of the preceding month and 100 on 1 October last year.

Eritrea : The maize crop has been damaged by drought and locusts.

Tunis : The great summer heat, sometimes accompanied by violent sirocco winds has damaged the maize crop and the following rains fell too late to improve the bad crop situation.

RICE

Italy : In the first half of September the growth of rice was in general good.

Mexico : Crop condition is generally good in the principal producing States.

India : In Bengal rainfall in September varied mostly from light to moderate with heavy falls in some areas. Transplanting of winter paddy was completed by about September 23rd and at the end of the month condition and prospects of standing crops were good. Heavy rains fell in parts of Bihar and Orissa in the first half of September, causing some damage to paddy in Balasore and Cuttack. Rainfall was variable in the

Rice.

COUNTRIES	AREA					PRODUCTION						
	1931/32	1930/31	Aver. 1925/26 to 1929/30	% 1931/32		1931/32	1930/31	Aver. 1925/26 to 1929/30	1931/32	1930/31	Aver. 1925/26 to 1929/30	% 1931/32
	1,000 acres					1,000 centals			1,000 bushels of 45 lbs.			
Bulgaria . .	14	17	18	85.0	79.0	290	366	329	645	814	730	79.3
Italy . . .	344	361	349	95.3	98.5	14,275	14,333	14,652	31,721	31,850	32,559	99.6
—												
Unit. States.	958	959	950	99.9	100.8	18,765	18,595	18,394	41,700	41,322	40,876	100.9
—												
China Man- churia . .	495	510	522	97.0	94.8	7,002	6,883	6,781	15,560	15,296	15,069	101.7
Formosa (1) .	677	660	615	102.7	110.1	14,477	13,892	12,208	32,164	30,871	28,775	104.2
Korea . . .	3,963	3,970	3,885	99.8	102.0	..	76,746	59,472	..	170,543	132,158	..
India . . .	77,429	74,102	73,766	104.5	105.0	..	1,039,870	1,048,178	..	2,421,886	2,329,239	..
Japan . . .	..	7,938	7,787	..	..	231,095	266,446	237,020	513,535	592,091	526,700	86.7

(1) First crop.

latter half of the month and more was needed for autumn paddy in Sambalpur ; on the whole, standing crops were in good condition. In Madras, rains varied from moderate to heavy and at the end of September condition was fair.

Japan : In September the crop condition of rice was rather bad, as it had not been favoured by the weather conditions.

Egypt : Crop condition of *Seifi* rice on 1 October was estimated at 94, against 100 at the beginning of the preceding month and 100 on 1 October last year.

POTATOES

According to the information at present available, yields have varied greatly in the different countries.

In a certain number of European countries, including Belgium, the Netherlands, England, Lithuania and Sweden, the excessive dampness, which favoured the spreading of disease, has given rise to some damage and the quality of the tubers has in some cases suffered severely, particularly on heavy lands, so that fears are entertained as to their keeping qualities.

In other countries, such as Austria, Hungary, and Italy, on the contrary, persistent drought has hindered the regular development of the tubers.

Of the large potato producing countries of Europe — which furnishes about 80 % of world production — the size of the crop is known for Germany, Poland and Czechoslovakia. Germany, which occupies the first place as producer of potatoes, has obtained an abundant crop, which, while remaining below the record figure of last year, exceeds the average of the preceding quinquennium by 13.6 %.

In Poland the crop has been the largest recorded since 1922 ; it exceeds that of last year and the five year average by 5.7 % and 23.4 % respectively.

Czechoslovakia reports less abundant yields than in previous years, yet the crop cannot be said to be bad.

Numerical data of production are still lacking for France, which is third in the order of importance of production. The news at present available is rather bad ; as

Potatoes.

COUNTRIES	AREA					PRODUCTION											
	1931		Aver		% 1931	1931		Aver.		1931		Average		% 1931			
	1930		to 1929			1930		to 1925		1930		to 1929		1930		Aver.	
	1,000 acres		= 100			= 100		1,000 centals		1,000 bush. of 60 lbs.		= 100		= 100			
Germany.	6,979	6,930	6,945	100.7	100.5	955,224	1,038,372	840,606	1,592,009	1,730,585	1,400,982	92.0	113.6				
Austria (s)	61	59	46	103.0	131.3	4,442	4,849	3,879	7,404	8,081	6,465	91.6	114.5				
Belgium (t)	418	407	406	102.6	102.7	38,056	53,642	46,051	63,426	89,401	76,751	70.9	82.6				
Belgium . .	402	402	408	100.0	98.4	60,949	65,310	74,752	101,580	108,847	124,584	93.3	81.5				
Bulgaria . .	32	35	26	92.9	122.3	1,720	1,852	829	2,866	3,086	1,381	92.9	207.5				
Estonia . . .	167	168	166	99.1	100.3	15,602	19,028	15,748	26,003	31,713	26,246	82.0	99.1				
Irish Fr. St .	348	346	369	100.4	94.3	...	52,359	52,714	...	87,265	87,854	...	...		
Finland . . .	174	175	172	99.3	101.0	15,997	17,314	16,784	26,661	28,856	27,972	92.4	95.3				
Engl. & Wal. .	447	425	503	105.2	88.9	53,133	61,443	72,272	88,555	102,405	120,450	86.5	73.5				
Scotland . . .	128	123	144	103.8	88.9	...	19,264	21,862	...	32,107	36,437	...	...		
Hungary . . .	710	673	652	105.6	108.9	32,152	40,597	43,333	53,586	67,060	72,221	79.2	74.2				
Italy	878	863	868	101.7	101.2	42,584	43,839	...	...	71,472	73,064	...	...		
Latvia	247	231	201	106.8	122.7	24,247	24,341	17,086	40,410	40,568	28,476	99.6	141.0				
Lithuania . .	389	403	347	96.5	112.2	...	41,643	32,287	...	69,404	53,810	...	...		
Luxemburg. . .	40	40	40	99.1	90.3	4,409	3,525	3,818	7,349	5,876	6,303	125.1	115.5				
Malta	7	7	7	90.2	97.0	670	844	590	1,117	1,074	999	104.0	111.8				
Norway	116	117	120	99.8	97.3	18,207	16,886	18,913	30,344	28,143	31,521	107.8	96.3				
Netherland. .	401	397	432	100.9	92.7	56,699	67,016	73,267	94,496	111,691	122,109	84.6	77.4				
Poland	6,490	6,602	6,125	98.3	105.9	720,032	681,282	583,290	1,200,030	1,135,448	972,146	105.7	123.4				
Rumania (t) .	489	468	482	104.5	101.4	52,382	39,993	42,587	87,802	69,654	70,976	181.0	123.0				
Sweden	327	336	366	97.5	89.4	30,865	39,668	38,039	51,440	66,112	63,397	77.8	81.1				
Switzerland. .	113	120	117	94.2	96.7	16,898	13,007	15,633	28,164	21,678	26,054	129.9	108.1				
Czechoslov. .	1,779	1,640	1,792	108.4	99.2	189,641	197,324	191,719	316,062	328,867	319,525	96.1	98.9				
—																	
*U. S. S. R. .	14,838	14,378	13,447	103.2	110.1	...	..	962,453	...	..	1,604,057	...	..		
—																	
Canada	576	571	552	100.8	104.3	55,535	48,241	44,747	92,559	80,402	74,577	115.1	124.1				
Unit. States .	3,506	3,167	3,369	110.7	104.1	225,000	205,800	228,306	375,000	343,000	380,502	109.3	98.6				
—																	
Syria & Leb. .	20	18	14	113.6	144.1	860	1,085	1,027	1,433	1,808	1,711	79.2	83.7				
—																	
Algeria (s) (t)	20	26	25	75.9	78.5	(t) 203	917	924	(t) 338	1,528	1,540	22.1	21.9				
Totals	23,521	23,014	22,966	102.2	102.4	2,372,923	2,642,136	2,374,218	4,288,134	4,403,483	3,956,948	97.4	108.4				

* Countries not included in the totals. — s) Early crop. — t) Late crop — (t) Unmixed crop. — (s) Not including Oran.

a result of excessive rains, mildew has caused considerable damage, but it is hoped that the fine weather in the last few weeks will improve the quality of the tubers.

Of the less important producing countries of Europe special mention is merited by this year's crop in Rumania, which exceeds that of last year by 31.0 % and the average by 23.0 %.

In the countries of North America, which, however, contribute only a relatively small part of world production (about 8 %), the crop has been very abundant in Canada (15.1 % above that of last year and 24.1 % above the average) and rather good in the United States (109.3 % and 98.6 %).

Summarising, it may be said that the world crop in 1931, while not reaching the high figure of last year, will give very satisfactory yields.

V. B.

Germany: Lifting of potatoes is in progress on heavy, impermeable lands; quality of the tubers is not altogether satisfactory due to rotting. On mellow lands yields are generally better and sometimes very good.

Austria : Water content of early potatoes is very high. Lifting was almost completely finished by the end of September. On this date, tops of late varieties were green but later frosts caused them to wither. Harvesting of these varieties has also begun. Yields vary greatly but are mostly satisfactory.

For the early varieties crop condition on 1 October was estimated at 2.6 as at the beginning of the preceding month and on 1 October last year.

The corresponding figures for the late varieties are 2.5, 2.3 and 2.3.

Belgium : Harvesting of potatoes is finished almost everywhere. Lifting was difficult at the beginning of the month due to rains but later this work was accomplished under good conditions. The crop is on the whole satisfactory, but on heavy or wet lands some tubers have been spoilt.

Estonia : Production of potatoes is less abundant than last year but quality is better; quality is particularly good in the principal potato producing areas.

Irish Free State : For conditions affecting potatoes, see "fodder crops".

France : The reports of considerable damage to crops by mildew are confirmed; lifting of potatoes is in progress and it is estimated that fine weather in the latter half of September and the first few days of October will improve the quality of the product.

Great Britain and Northern Ireland : In England and Wales lifting of potatoes had commenced in most areas by the end of September but conditions were not favourable to good progress. Reports indicate that the crop has been seriously affected by the excessive wet, especially on heavy soils, and that the widespread prevalence of disease will materially reduce the crop of sound tubers going into clamp (For weather conditions and field work, see "cereals").

In Scotland, an improvement in the weather conditions checked the spread of potato blight and the effect of the disease on the tubers has been less serious than was expected.

In Northern Ireland potatoes are digging out much better than was expected. The quality of the potatoes is very good despite the adverse weather conditions during the early summer. On light soils, results have been satisfactory both as regards the quality and yield. On heavy soils however, waterlogging and weeds combined to have a very serious effect and yields of sound tubers are likely to be reduced. The keeping qualities of the tubers are so far good although rotting has occurred in the drills in many low lying and damp areas. The complete returns of the year's potato crops will, it is anticipated, be lower than the average.

Hungary : At the end of the first ten days of October lifting and clamping of potatoes was in progress. The tubers are small but untouched by disease. Rains have improved the situation a little.

Italy : During September potato lifting was about finished.

Lithuania : Cold weather in September was unfavourable to potato crops.

Luxembourg : The potato crop is fairly abundant and quality is in general good.

Netherlands : Crop condition of potatoes for consumption varies greatly. In cases where no spraying was done to prevent disease, the latter appeared frequently. On peat lands the yield of potatoes for starch manufacture is not very good. As also the

area has been reduced and demand for direct consumption is fairly active, it may be anticipated that starch production in the present season will not reach half the quantity of the 1930 season or a third of that of 1928 or 1929.

Switzerland : Fine weather during September has greatly favoured potato lifting. Quality is in general fairly satisfactory. From the standpoint of quantity crop results are better than was forecasted before the harvest. The crop will meet home requirements for the winter and imports will be small.

Czechoslovakia : The potato crop, which has given rise to good hopes, will be reduced due to rotting which has set in especially among the tubers destined for direct consumption as food.

Canada : According to a telegram of October 9th., received from the Government of Canada, yields of potatoes in Quebec and Ontario are considerably above the average. In western Quebec and eastern Ontario crops have been reduced by drought but the other regions have been favoured by excellent growing seasons. In the Maritime and Prairie Provinces and British Columbia yields are well below the average, although quality is generally high. In the Maritimes yields per acre are approximately 10 % below the long time averages. The summer drought has been extremely detrimental to yields in southwestern Manitoba, southern Saskatchewan and southeastern Alberta, but in northern farming districts and along the foothills of Alberta, large yields have been harvested.

United States : Potato digging was generally well advanced by September 24, yields varying widely in different sections of the country.

Palestine : Land is being prepared for the crop.

Tripolitania : The area under potatoes was 7,400 acres and production is estimated at 106,000 centals (176,000 bushels) representing a yield of 14 3 centals (23.8 bushels) per acre.

SUGAR SEASON

The growth of sugar-beet in the different beet producing countries of Europe has not, this year, been favoured by the best of conditions but from sowing until ripening, the course of the season, although not very propitious, has constantly improved. The information available at the end of the first half of October indicates, in general, a satisfactory condition. In the southern countries, harvesting is finished. In those of central and northern Europe, on the contrary, it is still in progress. Lifting is being effected regularly, favoured by the weather, and the bulbs are clean and free from disease. Sugar content is fairly high and often above the normal. These propitious conditions were especially in evidence in Germany, France and Czechoslovakia and, among the minor producing countries, in Austria, Belgium and Hungary. In Bulgaria, Spain and Italy the harvest is already finished.

Among the large producing countries of Europe, little good news has been received from Poland and the U. S. S. R. In Poland the rains and cold have been adverse to the maturity of the beet, harvesting of which was rendered difficult by the wetness of the soil. In the U. S. S. R., on the contrary, weather conditions have been favourable but harvest operations are proceeding more slowly than last year as the large in-

crease of area sown to sugar-beet was not accompanied by adequate labour supplies or means of transport.

If these difficulties continue, part of the crop will be destroyed.

In the following table is published the first estimate of probable production of beet-sugar in the season 1931-32.

Production of Beet-sugar (raw).

COUNTRIES	Total production during the season						% 1931-32	
	1931-32(i)	1930-31	Average 1925-26 to 1929-30	1931-32(i)	1930-31	Average 1925-26 to 1929-30	1930-31	average
							= 100	= 100
	thousand centals			short tons				
Germany	33,811	56,182	38,741	1,680,548	2,808,077	1,987,088	60	87
Austria	3,417	3,312	2,185	171,000	165,620	109,260	103	156
Belgium	6,001	6,138	5,949	300,035	306,894	297,449	98	101
Bulgaria	772	1,204	602	39,000	60,205	30,090	64	128
Denmark	2,756	3,890	3,303	133,000	185,000	165,147	75	83
Spain	6,393	6,253	4,813	320,000	312,660	240,638	102	133
Irish Free State	220	488	436	10,000	23,390	21,794	47	51
Finland	88	85	69	4,400	4,267	3,441	103	128
France	19,621	26,557	18,258	980,000	1,327,816	912,883	74	107
Great Britain	6,504	9,688	4,032	325,000	484,869	201,611	67	161
Hungary	3,417	5,154	4,856	171,000	257,712	219,317	66	78
Italy	7,526	9,382	7,039	391,000	469,090	351,957	83	111
Netherlands	3,417	6,359	6,212	171,000	317,959	310,575	54	55
Poland	12,885	17,099	15,045	644,258	854,957	752,221	75	86
Rumania	1,323	3,820	2,745	70,000	181,010	137,268	37	48
Sweden	3,153	4,112	2,881	158,000	205,618	144,032	77	109
Switzerland	132	126	152	7,000	6,300	7,600	105	87
Czechoslovakia	16,907	25,173	26,016	845,314	1,258,614	1,300,763	67	65
Turkey	353	214	101	18,000	10,700	5,028	165	351
Yugoslavia	1,874	2,241	2,082	94,000	112,067	104,109	84	90
<i>Total, Europe . . . a)</i>	<i>180,670</i>	<i>187,046</i>	<i>145,047</i>	<i>6,537,555</i>	<i>9,852,325</i>	<i>7,252,221</i>	<i>70</i>	<i>90</i>
U. S. S. R.	40,234	38,288	24,066	2,012,000	1,914,400	1,203,288	105	167
<i>Total, Europe . . . b)</i>	<i>170,904</i>	<i>225,234</i>	<i>169,113</i>	<i>8,549,555</i>	<i>11,266,725</i>	<i>8,455,509</i>	<i>76</i>	<i>101</i>
Canada	860	1,075	769	43,000	53,763	38,435	80	112
United States	20,710	25,979	21,644	1,035,000	1,299,000	1,032,205	80	96
<i>Total, America . . .</i>	<i>21,570</i>	<i>27,054</i>	<i>22,413</i>	<i>1,078,000</i>	<i>1,352,763</i>	<i>1,120,640</i>	<i>80</i>	<i>96</i>
*Korea . . . . .	...	22	13	...	1,109	635	...	...
*Japan . . . . .	...	532	545	...	26,583	27,231	...	...
<i>Total, Asia</i>	<i>...</i>	<i>554</i>	<i>558</i>	<i>...</i>	<i>27,692</i>	<i>27,866</i>	<i>...</i>	<i>...</i>
*Australia . . . . .	...	75	48	...	3,752	2,410	...	...
General totals . . . { a)	152,240	214,100	167,460	7,615,555	10,705,088	8,372,861	71	91
 { b)	192,474	252,388	191,526	9,627,555	12,619,488	9,576,149	76	100

(*) Countries not included in the totals — a) Not including U. S. S. R. — b) Including U. S. S. R. — (i) Approximate data.

As in past years, the estimates published have been derived from the annual inquiries made by this Institute of the different Governments and the various organisations of sugar manufacturers in the different countries. The data published have been partly communicated directly and partly formulated on the basis of news on crop conditions, sugar content and yields per acre, which have been communicated to the Institute in the absence of numerical estimates. In cases where these data were also lacking, those of the "Association Internationale Sucrière" of Vienna have been adopted and inserted in a separate table. The first estimates are naturally approximate, as the beet harvest is still in progress, but, this year, to render these estimates more uncertain, there is also the possibility that some countries will not convert into sugar all the beet produced, due to the unsold stocks residual from preceding years.

According to the totals and the percentages calculated from the estimates published by the Institute, the production of sugar in the season 1931-32, is 24% below that of last season and nearly equal to the average, both for Europe (including the U. S. S. R.) and for Europe, the U. S. S. R. and North America combined.

Considering the total for Europe, excluding the U. S. S. R., the decrease compared with the season 1930-31 would be raised to 30% and in comparison with the average, there would be a reduction of 10%.

This decrease, as was indicated in the September Report, is to be attributed to the decrease in area sown and to the not very favourable conditions for the crops.

It is not improbable, however, that these estimates have been formulated with perhaps excessive prudence and that they may ultimately be raised E. R.

The figures in the following table are supplied by the "Association Internationale Sucrière" of Vienna.

COUNTRIES	Sugar-beet		Raw sugar	
	1931	1930	1931-32	1930-31
Centalis				
Germany	210,646,900	350,364,980	33,611,410	56,162,310
Austria	22,596,600	21,239,870	3,426,000	3,312,880
Belgium	29,190,000	41,419,380	4,000,000	6,178,540
Bulgaria	4,000,000	8,990,000	620,000	1,288,600
Denmark	17,000,000	22,648,000	2,790,000	3,690,000
Irish Free State	1,100,000	3,588,000	180,000	570,000
Finland	730,000	698,250	90,000	85,340
Hungary	21,630,000	34,233,910	2,935,200	5,162,600
Italy	54,000,000	73,507,000	7,837,000	9,084,200
Poland	73,000,000	102,141,060	12,100,000	17,243,930
Sweden	20,872,800	26,125,170	3,150,000	4,115,400
Czechoslovakia	99,872,800	148,987,640	16,906,510	25,172,620
Turkey	2,810,000	1,260,000	342,000	214,000
Yugoslavia	14,010,000	16,459,100	1,805,350	2,264,000
Total . . .	570,986,300	851,612,360	89,763,470	134,553,420
Short tons				
Germany	10,532,200	17,518,011	1,680,548	2,808,077
Austria	1,129,810	1,061,979	171,300	166,642
Belgium	1,450,000	2,070,941	200,000	308,923
Bulgaria	200,000	450,000	31,000	64,430
Denmark	850,000	1,132,400	138,000	185,000
Irish Free State	60,000	176,900	9,000	29,000
Finland	36,000	34,912	4,000	4,267
Hungary	1,081,000	1,711,672	146,780	258,127
Italy	2,700,000	3,675,300	391,900	454,200
Poland	3,600,000	5,106,983	610,000	862,185
Sweden	1,050,000	1,306,241	158,000	205,787
Czechoslovakia	4,993,570	7,449,281	845,314	1,258,614
Turkey	116,000	63,000	17,100	10,700
Yugoslavia	700,500	882,940	90,266	113,198
Total . . .	28,508,080	42,580,560	4,493,188	6,728,130

* * *

Germany: The development of sugar-beet is in general, satisfactory.

Austria: At the end of September the foliage of sugar-beet was exceptionally abundant whereas the roots had increased little in size. Their sugar content was still rather low.

Crop condition on 1 October was estimated at 2.4 against 2.7 at the beginning of the preceding month and on 1 October last year.

Belgium : A good normal crop of sugar beet is anticipated.

France : In some departments lifting of sugar-beet had commenced at the beginning of October in good weather.

Great Britain and Northern Ireland : In England and Wales reports confirm the estimate that both the yield per acre of sugar-beet and the sugar content will be lower than usual. (For weather conditions and field work see "potatoes").

In Scotland sugar-beet made fairly good progress but suffered from a scarcity of rain during September.

Sugar-beet.

COUNTRIES	AREA					PRODUCTION							
	1931	1930	Aver. 1925 to 1929	% 1931		1931	1930	Aver. 1925 to 1929	1931	1930	Aver. 1925 to 1929	% 1931	
				1930 = 100	Aver. = 100							1930 = 100	Aver. = 100
1,000 acres					1,000 centals			1,000 short tons					
Germany	941	1,194	1,063	78.9	88.6	233,664	328,900	237,119	11,683	16,445	11,856	71.0	81.0
Belgium	140	140	162	100.0	86.4	37,519	41,123	40,705	1,876	2,056	2,085	91.2	89.0
Bulgaria	37	49	35	76.0	106.1	5,291	6,889	4,247	265	344	212	76.8	121.0
Finland	5	3	5	161.6	94.3	794	683	773	40	34	39	116.1	100.0
*England and Wales	233	347	162	67.1	144.0	...	68,130	28,306	...	8,407	1,415	...	...
*Scotland	1	2	4	66.1	30.0	...	269	442	...	13	22	...	...
Hungary	142	183	163	77.3	84.5	21,319	32,210	32,047	1,066	1,610	1,647	66.2	68.0
Italy	266	277	226	96.2	117.8	50,706	66,600	51,465	2,535	3,380	2,573	76.1	90.0
Netherlands	91	142	157	64.2	58.1	22,346	47,127	46,841	1,117	2,356	2,317	47.4	48.0
*Poland	376	457	510	82.3	73.8	...	103,993	92,177	...	5,200	4,609	...	...
Sweden	91	91	78	100.0	116.9	19,842	26,787	19,233	992	1,339	962	74.1	100.0
*Czechoslovakia	441	554	675	79.7	65.4	...	141,567	157,619	...	7,078	7,881	...	...
U. S. S. R.	3,332	2,533	1,626	131.6	204.9	374,737	334,434	186,268	18,739	16,721	9,313	112.1	200.0
Canada	52	52	46	99.0	113.4	7,440	9,420	8,685	372	471	434	79.0	80.0
United States	754	821	675	91.8	111.6	143,200	184,000	147,105	7,160	9,200	7,355	77.8	90.0
Totals	5,851	5,485	4,241	106.7	138.0	916,968	1,078,173	774,868	45,845	53,966	38,743	85.0	100.0

* Countries not included in the totals.

* Countries not included in the totals.

Hungary : On about October 10 pulling and carting of sugar beet had commenced in the different producing regions. Rains previous to this period were very favourable for the growth of the bulbs and crop forecasts have improved.

Italy : Lifting of beet continued in September and is now nearly finished.

Czechoslovakia : The beet have greatly benefited by the abundant rains.

U. S. S. R. : During September and the first week of October weather conditions were on the whole favourable. On October 4 sugar-beet had been lifted from an area of 1,526,000 acres or 45.8 % of that sown for the purpose of sugar production. In the Ukraine, which is the principal beet producing centre of the Union, the percentage was 44.9 %, and in the central Black Earth area, another important producing centre, 52.4 %.

Harvest should end preferably on about October 15 in the central Black Earth area and on about October 20-25 in the Union, because if operations are prolonged after this date, a certain quantity of the product may be lost due to the cold. Harvesting has slackened recently and is proceeding more slowly than last year.

Transport to the factories is rather in delay : On October 4 no more than 40 % of the beet pulled had been transported whereas at the same date of last year the percentage exceeded 50 %.

From the area harvested as on October 1, representing 38.4 % of that sown, 112 million centals (5,600,000 short tons) have been obtained.

United States : At the end of September sugar-beet lifting was progressing in the West. and sugar-cane in the South needed rain.

Production of cane-sugar for the season 1931-32 is estimated at 3,320,000 centals (166,000 short tons) against 3,674,000 (184,000) in 1930-31 and 1,911,000 (96,000), the average for the preceding five seasons ; percentages : 90.4 and 173.7.

Crop condition on 1 October was estimated at 61.7 against 62.9 at the same date last year.

Mexico : Crop condition in the principal producing States is in general good. Some small damage by floods at the end of August has been reported in only a few regions

Formosa : Production of sugar-cane in the season 1931-32 is estimated at 154,342,000 centals (7,717,000 short tons) against 129,780,000 (6,489,000) in 1930-31 and 122,777,000 (6,139,000) on the average for the preceding five seasons ; percentages : 118.9 and 125.7. The corresponding production of sugar is estimated at 20,279,000 centals (1,014,000 short tons) against 17,577,000 (879,000) last season and 13,629,000 (681,000) on the average . percentages : 115.4 and 148.8.

Sugar Season 1931-32. — Analysis of Sugar-beet.

COUNTRIES	Average weight of root			Average weight of leaves			Sugar content ^c			Weight of sugar per root		
	1931	1930	1925-1929	1931	1930	1925-1929	1931	1930	1925-1929	1931	1930	1925-1929
	OZS	OZS	OZS	OZS	OZS	OZS	%	%	%	OZS	OZS	OZS

3RD. WEEK OF SEPTEMBER

Belgium.	21.2	22.5	(1) 19.2	23.7	34.1	(1) 23.2	16.6	14.0	(1) 16.2	3.5	3.2	(1) 3.2
Finland	14.4	16.8	15.7	13.5	14.4	15.3	16.7	17.2	16.3	2.4	2.0	2.6
Czechoslovakia. . .	19.3	17.0	15.7	13.4	12.8	13.7	17.6	17.5	17.3	3.4	3.0	2.7

4TH. WEEK OF SEPTEMBER

Germany	20.0	20.3	17.4	19.0	19.0	17.5	17.3	17.1	15.0	3.3	3.4	3.0
Denmark	14.5	18.3	16.9	13.0	14.7	15.1	17.4	17.2	15.9	2.5	3.1	2.8
Finland	18.6	21.8	(2) 16.3	25.3	25.3	(2) 23.5	16.0	16.0	(2) 14.4	3.1	3.5	(2) 2.4
France	18.3	20.6	(3) 17.3	20.6	21.1	(3) 16.4	17.7	16.4	(3) 16.7	3.2	3.4	(3) 2.9
Czechoslovakia. . .	19.8	17.8	16.9	12.7	12.4	12.6	18.0	18.0	17.7	3.6	3.2	3.0

LAST WEEK OF SEPTEMBER

Finland	21.1	22.6	(4) 15.9	26.6	25.6	(4) 22.6	16.5	15.8	(4) 14.4	3.8	3.6	(4) 2.3
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1ST. WEEK OF OCTOBER

Netherlands.	23.0	27.7	(5) 26.9	—	—	—	18.6	17.0	(5) 18.1	4.3	4.6	(5) 4.9
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(1) Average 1925, 1928 and 1929. — (2) Average 1925 and 1927 to 1929. — (3) Average 1925 to 1928. — (4) Average 1927 to 1929. — (5) Average 1928 and 1929.

India : Rainfall varied from light to heavy during September in the United Provinces and some damage was caused to crops locally where rains were heavy ; at the end of the month, however, standing crops were doing well and prospects were favourable. In the Punjab heavy rains fell at the beginning of the month ; at the end of the month condition was average to good. Rains in Bihar and Orissa were heavy in some areas and deficient in others ; at the end of September crops were in good condition.

Egypt : Crop condition of sugar-cane on 1 October was estimated at 101, the same as at the beginning of the preceding month, against 100 on 1 October last year.

Madagascar : Area of sugar cane this year is 54,000 acres, an increase of 4.1 % on that of last year (52,000 acres) and an increase of 41.9% on the average of the four years ending 1928-29 (38,000 acres).

Production this year is 9,259,000 centals (463,000 short tons), an increase of 16.7 % on that of last year, 7,937,000 centals (396,800 short tons) and a decrease of 1.2% on the average (9,370,000 centals ; 468,500 short tons).

Production of cane-sugar this year is 143,000 centals (7 200 short tons) an increase of 6.6 % on that of last year (134,000 centals ; 6,700 short tons) and an increase of 66.3 on the average of the five years ending 1929-30 (86,000 centals ; 4,300 short tons).

Union of South Africa . Production of cane-sugar this year is estimated at 6,640,000 centals (332,000 short tons), a decrease of 15.5 % on that of 1930-31 (7,860,000 centals ; 393,000 short tons) and an increase of 25.3 % on the average of the five years ending 1929-30 (5,297,000 centals or 265,000 short tons).

The August crop condition averaged 21 % below normal. The weather has been very dry and cold and the rainfall over the sugar belt averaged only a quarter of an inch. In the North of Zululand mature cane is drying for want of rain.

VINES

Except in some countries of eastern Europe, the weather from the middle of September to the middle of October was on the whole favourable to the complete ripening of the fruit and to the vintage.

The official estimates of wine production in the most important vine growing countries are not yet known : the most recent estimates, however, to some extent confirm the forecasts already made in the Report of last month, giving a total production in the northern hemisphere of 3,300—3,500 million Imperial gallons (3,960-4,230 million American gallons).

In France, crop declarations are being made and in some departments, will continue until the beginning of November : on the basis of these declarations may be ascertained, besides the production in the present year, also the stocks of the old crop in producers' hands. The Interdepartmental Viticultural Commission has recently estimated the total production of wine in France and Algeria at 1,540-1,580 million Imperial gallons (1,850-1,900 million American gallons) ; as the Algerian production is known (305.8 million Imperial gallons or 367.2 million American gallons) the French production may be calculated at 1,230-1,280 million Imperial gallons (1,480-1,530 million American gallons) ; in the southern regions, production is considered to be superior to that of 1930 as regards both quality and quantity.

The French market is very quiet and the limited transactions are being very prudently

Vines.

COUNTRIES	AREA					PRODUCTION							
	1931	1930	Aver. 1925 to 1929	1931		1931	1930	Aver. 1925 to 1929	1931	1930	Aver. 1925 to 1929	% 1931	
				1930	Aver.							1930	Aver.
1,000 acres						1,000 Imperial gallons			1,000 Americ. gall.				
Germany. .	204	203	201	100.5	101.4	...	61,895	35,549	...	74,381	42,691	...	...
Bulgaria. .	217	205	189	106.0	114.8	61,769	57,744	33,235	74,179	69,345	39,912	107.0	185.9
Italy . {s)	1,908	1,939	2,078	98.4	91.8	...	798,903	906,147	...	959,441	1,088,201	...	...
Italy . {f)	8,398	8,584	8,567	97.8	98.0	...	...	...	...	...	...	...	...
Luxemburg.	3	3	4	100.0	84.5	1,936	844	1,063	2,325	1,014	1,277	229.3	182.1
Switzerland	..	33	35	..	...	14,958	14,078	12,282	17,964	16,907	14,750	106.2	121.8
Czechosl. .	47	44	42	105.5	111.4	..	10,427	4,864	..	12,521	5,841	...	..
—													
Syria and Lebanon.	124	126	123	98.6	101.0	—	—	—	—	—	—	—	—
—													
Algeria . .	730	671	(1) 595	108.9	122.6	305,766	299,169	281,277	367,197	359,275	277,743	102.2	132.2
Fr. Morocco	29	18	15	163.7	200.8	5,543	2,750	3,080	6,657	3,302	3,698	201.6	180.0
Tunis . . .	98	87	74	113.1	133.5	15,398	21,998	18,898	18,492	26,417	22,694	70.0	81.5

s) Unmixed crop. — f) Mixed crop. — (1) Average 1926, 1928 and 1929.

made; purchasers are little disposed to acquire large lots and under these conditions it does not seem that prices will rise in a short time.

In Italy, it is estimated that the present year's crop may yield more than that of 1930, because the production of wine grapes has exceeded that of the previous season by about 1,100,000 centals. On drawing off, the wines were found to be in general good and rich in alcohol and colour. The wine trade is very inactive due to the disinclination shown by purchasers; prices are rather low.

In Spain, towards the middle of the month the vintage was general and was progressing well in favourable weather. The crop is on the whole estimated to be below the normal, but the fruit is generally judged to be of good quality; prices have been maintained and the market is quiet.

In Greece also, the harvest is nearly finished and the crop, it is anticipated, is of good quality as the intense summer heat encouraged a high alcoholic content; the crop promises to be small.

In Austria, Hungary and Rumania ripening and the vintage have been in general hindered by the prevailing weather conditions.

The group of French North African colonies has already communicated the data of wine production in the present year; total production is estimated at 326.7 million Imperial gallons (392.3 million American gallons) against 323.9 (389.0) in the 1930 season.

M. C.

Germany: Ripening of the grapes has made only slow progress but the vintage was begun early because rotting was causing rather serious damage in different regions. In general, yields were expected to be satisfactory as regards quantity. Previous hopes of good quality fruit were hardly realised owing to the absence of sun.

Austria : The fruit has not ripened completely due to lack of sun. The late varieties are especially acid and often rotten. Vintage results have been very good but the must rarely reaches 20 degrees and for the Riesling variety is hardly 15 degrees (Klosterneuburg). The acid content is 10 or even 12 %. In the regions of better production a very large quantity of grapes have been used for the table.

Crop condition on 1 October was estimated at 2.3 against 1.8 at the beginning of the preceding month and 1.9 on 1 October last year.

France : Vintage began in the South at the beginning of September and was about finished by the middle of the present month : in the other producing areas it proceeded actively. Harvesting was generally favoured by the weather except in a few places where light rains fell. On the whole, good average quality is anticipated.

The general movement of the wine market in the last half month showed little change worthy of comment. Business remains rather difficult and prices show no signs of rising.

Hungary : The continually cold rainy and misty weather before October 10 caused extensive rotting of grapes ; vintage has already begun except in the Tokajhegyàlia where the large proprietors are awaiting an auspicious moment to begin.

Italy : Production of wine grapes is estimated at 128,145,000 centals (74,826,000 mixed crop and 53,319,000 simple crop) compared with a final production in 1930 of 126,969 000 centals (73,009,000 mixed crop and 53,960,000 simple crop) ; percentages : 102.5 for the mixed crop and 98.8 for the simple crop.

Harvest results confirm the forecasts of not very abundant production; the grapes, which are, however, of good quality and have a considerable sugar content, will give rather alcoholic wines.

Luxembourg : Sunny days towards the end of September have had a favourable influence on the vines.

Rumania : Cold weather and hoar-frost have caused some damage to vines and injured the leaves before the fruit was quite mature.

Canada : Production of grapes in Ontario and British Columbia is estimated at 51,262,000 lb. compared with 43,374,000 obtained in 1930, representing an increase of 18.2 %. In Ontario, which produces nearly the whole of this total, in September most varieties were showing a heavy crop and pests were well controlled.

United States : Production of grapes this year is estimated at 32,600,000 centals, (1,630,000 short tons) a decrease of 33.7 % on that of last year (49,191,000 centals or 2,460,000 short tons) and a decrease of 32.2 % on the average of the five years ending 1929 (48,062,000 centals or 2,403,000 short tons).

Crop condition on 1 October was estimated at 54.3 against 55.0 at the beginning of the preceding month and 80.5 at the same date last year.

Palestine : The vintage is about completed on the plains. Hill vineyards are still yielding plentifully. The late crop of grapes from Jerusalem and the Ramallah hills is below the average. Crop condition at the end of September was average.

Algeria : In all the plain areas the vintage is completely or nearly finished while it is proceeding actively in mountain areas. In the Department of Oran weather conditions have been favourable and fermentation has been good. In some regions of the Department of Algiers, the vintage has yielded mediocre results ; alcoholic content is

low and the colour pale. At Bône on the contrary, results have been generally satisfactory. In the Philippeville region production has been greatly deficient, the extent varying according to district, as a result of the summer scirocco.

Cyrenaica : Dry weather and " ghibli " during the spring damaged the vines.

French Morocco : Weather conditions during September were favourable to vines and only slight damage was caused by scirocco in the region of Oudjda.

Tripolitania : Weather conditions have been unfavourable to the crops.

Production of grapes this year is estimated at 26,000 centals and that of wine at 130,000 Imperial gallons (160,000 American gallons).

Tunis : The scirocco has damaged the vines and in numerous vine centres has reduced yields from 25 to 75 %.

OLIVE OIL

Recent information on the whole confirms the forecasts already made of oil production in the present season in the countries of the Mediterranean basin.

In Spain, the drought has caused considerable damage and attacks of fly and other insects have been numerous ; although, in some important provinces such as Lerida, Seville, and Jaén, production is estimated at good to normal, in several other provinces, the crop is anticipated to be very small, from 30 to 60 % below the average. Stocks remaining from previous crops are now greatly diminished and as sellers, while awaiting news of the size of the new crop, are not encouraging transactions, prices are well maintained with a tendency to rise.

In Italy, the state of growth of olives at the beginning of October had rather improved compared with the preceding weeks, but the crop, due to prolonged dropping of fruit, will in several provinces be rather small. The oil market is, on the whole, calm and prices are not fluctuating much.

Algeria and Tunis anticipate an abundant oil production, of a little over 1,800,000 centals (23,000,000 American gallons) compared with about 660,000 (8,700,000) last year, which was, however, a year of very small production.

In Portugal, the rains which fell at the end of the summer were beneficial to the olives and producers hope for an almost normal crop.

M. C.

* * *

Italy : During the first half of September, there were again some cases of dropping of olives and some sporadic attacks of fly. In some of the larger producing provinces the crop was variable.

United States : Crop condition of olive on 1 October was estimated at 44 against 48 at the beginning of the preceding month and 61 at the same date last year.

Palestine : Development of fruit is satisfactory. Fair yields are expected. Crop condition at the end of September was good.

Algeria : Production of oil this year is 475,000 centals (6,236,000 Amer. gallons) an increase of 86.5 % on that of last year (254,000 centals ; 3,344,000 Amer. galls.) and an

increase of 2.7 % on the average of the five years ending 1929-30 (462,000 centals or 6,075,000 Amer. galls.).

Cyrenaica : Adverse weather conditions last spring damaged olive crops.

French Morocco : Weather conditions have in general been favourable to olives ; in the Oudjda region, however, considerable damage was caused by dropping due to the scirocco.

Tripolitania : Weather conditions have been unfavourable to the growth of olives.

Tunis : The condition of olives is normal and despite a notable amount of dropping due to hot winds, the crop is judged to be fairly good.

COTTON

The October estimate of the United States Department of Agriculture again exceeds anticipations ; the production now forecast is larger by 2,863,000 centals (599,000 bales), or 3.8 % than the September 1 forecast, and exceeds all preceding crops, apart from the exceptional one of 1926-27 which amounted to 85,932,000 centals (17,977,000 bales). The increase in the estimate is explained by the fact that during September, weather conditions have been exceptionally favourable to maturity, bringing about a great improvement in prospects for a good crop in Arkansas, Mississippi, and to a smaller extent, in Alabama, Georgia, Tennessee and Missouri. On the whole, crop condition in September was 16 % above the average of the last ten years. The publication of the new estimate of the United States may be said not to have disturbed the market, as the effects of abundant supply had already been discounted and also because financial and political factors of international scope have brought about a recovery of purchases and consequently an improvement in prices. The fact that ginning of the new crop is proceeding with a certain slowness compared with recent years exerts also a favourable influence on prices.

The Egyptian Government on October 5, published the first estimate of the crop of 1931-32, forecasting a decrease of 20.6 % in comparison with the final production of last year. This decrease is larger than those previously indicated by private estimates. Production of lint, excluding linters, of the different varieties, is forecast as follows : *Sakellaridis* : 1,347,000 centals (282,000 bales) ; other long staple varieties (*Maarad*, *Giza 7*, *Sakha 4*), 525,000 centals (110,000 bales) ; medium staple varieties (*Nahda*, *Fuadi*, *Casulli*), 352,000 centals (74,000 bales) ; short staple varieties (*Ashmouni*, *Zagora*, *Pilion*, *Giza 3*, etc.), 4,132,000 centals (864,000 bales). Production of the *Sakellaridis* variety amounted in 1930-31 to 2,089,000 centals (437,000 bales) and to 2,670,000 centals (559,000 bales) in 1929-30. Harvesting operations are about to be finished ; but ginning is proceeding very slowly. The first report, giving the quantity ginned up to the end of September, shows a total less than half of the corresponding quantity for 1930. This fact, however, should be considered in relation to the 50 % reduction of the Government tax (see September Report) on ginnings since September 15, which has induced planters to restrict ginnings until that date. By two Decrees dated September 27 the Government has decided to reduce the area to be sown next season to 30 % of the cultivable area in the case of *Sakellaridis*, keeping in force the decree of last February prohibiting the cultivation of *Sakellaridis* outside certain districts in the north of the Delta (see April Report) and to reduce that sown to other varieties to 25 %. The acreage thus liberated will be devoted principally to cereals, with the object of bringing about a large reduction of imports. This decision is in contrast to the *stable* cotton policy adopted by the Government in 1930, according to which the production of *Sakellaridis* was to be restricted, as Egypt may be said to have a monopoly, and encouragement was to be given, on the other hand, to increased production of other varieties and

Cotton.

COUNTRIES	AREA						PRODUCTION							
	1931/32	1930/31	Aver. 1925/26 to 1929/30	% 1931/32		1931/32	1930/31	Aver. 1925/26 to 1929/30	1931/32	1930/31	Aver. 1925/26 to 1929/30	% 1931/32		
				1930/ 1931	Aver. = 100							1930/ 1931	Aver. = 100	
1,000 acres				1,000 centals				1,000 bales of 478 lbs.						
Bulgaria	16	14	11	118.5	147.8	26	21	15	5	4	3	120.5	177.2	
* U. S. S. R. . .	5,825	3,870	1,974	150.5	295.1	..	7,639	5,030	...	1,598	1,052	...	..
United States .	40,889	45,091	44,882	90.7	91.1	77,838	66,505	72,983	16,284	13,982	15,268	116.9	106.7	
Mexico	326	300	472	83.5	69.1	1,011	848	1,208	211	178	253	119.1	83.6	
*Korea	461	463	495	99.6	93.0	...	726	658	...	152	138	...	...
*India (1) . . .	19,654	20,506	21,584	95.8	91.1	..	19,230	22,487	...	4,033	4,704	...	..
*Syria & Lebanon	76	60	58	123.3	130.9	...	59	47	...	12	10	...	...
Algeria	3	10	15	31.4	21.3	11	25	27	2	5	6	42.6	39.8	
Egypt	1,747	2,162	1,828	80.8	95.6	6,355	8,005	7,588	1,329	1,675	1,587	79.4	83.8	
Erythra	7	7	7	107.1	111.1	11	8	8	2	2	2	140.8	140.4	
*Tanganyika . .	—	—	—	—	—	56	93	98	12	19	21	60.3	56.8	
Totals	42,988	47,674	47,215	90.2	91.0	85,252	75,502	81,829	17,833	15,796	17,119	112.9	104.2	

* Countries not included in the totals. — (1) Estimate of the second report, area representing about 90 % of the total area.

lowering of costs of production in order to be able to sell advantageously in competition with other cotton producing countries. The Government arrived at these conclusions after prolonged and detailed statistical studies, which showed that the price of Egyptian cotton is not in correlation with either the quantity produced in the country, about 6 % of world production, or with the area cultivated, but depends almost entirely on the price fixed on the world market for American cotton. The measures now adopted, however, are related, in the wording of the Act, to the exceptional conditions obtaining, due to which any equilibrium of supply and demand is prevented, while the policy adopted in 1930 was based on the assumption of a normal economic situation, and also to the fact that the consumption of Egyptian cotton in 1930-31 was 9 % below that of the previous year and over 16 % below that of 1928-29. In the future consumption may ultimately decrease and be maintained at a level below the present average annual production. Moreover, if there is added to this year's crop the quantity of existing stocks, the resulting amount is double the average annual consumption.

The rise in prices of American cotton and local factors such as damage caused by insects, have improved prices, but, on the other hand, the depreciation of currency tends to diminish the extent of the improvement.

The second report on the area sown to cotton in India, which represents about 90 % of the total area, confirms the reduction indicated in the first report and therefore the fact that the cultivation of cotton in India is decreasing. In order to increase the home consumption of Indian cotton, the Government has imposed a protective duty of 9/16d per lb. on imported cotton. This particularly hits Egyptian cotton, the exports of which to India increased greatly last season. The condition of the crop and the weather do not, on the whole, seem favourable to the quality of the lint but the crop is forecast to be abundant.

In the U. S. S. R., picking began in the latter half of September and the partial results known appear to confirm the forecasts made in August.

I. S. '

* * *

U. S. S. R. : Cotton picking was in general progress in the latter half of September. On 5 October 5,082,000 centals (1,063,000 bales) of cotton had been picked.

United States : Warm, dry weather in the last two weeks of September was favourable to cotton but there were frequent reports of premature opening of bolls and shedding. Although much cotton was ready to pick and the weather favoured picking and ginning, these operations made mostly slow progress. In the first week of October temperatures continued favourable and, according to a telegram of October 14, harvesting was proceeding under good conditions.

Cotton ginned, not including linters, to close of business on 30 September amounts to 5,408,000 running bales (counting round bales as half-bales), against 6,304,000 and 5,903,000 bales respectively in 1930 and 1929. Crop condition of cotton on October 1, was 69.3 per cent. compared with 68.0 per cent., on September 1, 53.5 per cent. on October 1, 1930, and 53.3 per cent., the ten-year average (1920-29) for October 1.

Mexico : In the States in which sowings have already been effected, crop condition is good. Yields of the past season are considered to be satisfactory.

India : During September, rainfall varied from heavy to moderate in many districts of Madras. On October 9 it was estimated that 621,000 acres would be planted with cotton compared with 708,000 in 1930-31 and 823,000 the average of the preceding five seasons; percentages: 87.7 and 75.5. Sowing had commenced and the crop already sown was germinating evenly and uniformly. Heavy rains in some sections of the Punjab damaged crops in the first half of September, and bollworm in parts of Sheikhpura. At the end of the month, however, crop condition varied generally from average to good and picking had begun. On October 6, the acreage under cotton in the Punjab was estimated at 2,257,000 acres, against 2,320,000 in 1930-31 and 2,437,000, the average of the preceding five seasons; percentages: 97.3 and 92.6; crop condition was estimated to be 99 % of the normal compared with 89 % at the same date of last year. In Bombay Presidency rains in the first half of September were heavy in some districts and deficient in others; in Sind no rain fell but irrigation water was adequate. In the latter half of the month cloudy weather and considerable rain affected cotton in Khandesh and in South Deccan, where fair weather was required. More rain was needed in parts of East Karnatak. In the Central Provinces, weather on the second and third weeks of September was clear and sunny with occasional clouds and light to moderate rainfall; in the last week of the month rainfall was heavy locally, causing stunted growth, cotton, especially on rich soil, was damaged by weeds and waterlogging at the beginning of October.

Algeria : Despite the dryness of the summer the growth of cotton is satisfactory and the crop would have been a very good one if the rather large damage caused by pink boll worm had not occurred.

Egypt : Weather conditions in September were changeable. Warm weather with mild day temperatures, damp, cool nights and morning mists, was not very favourable to ripening and opening of bolls in Lower Egypt; conditions were, however, more pro-

pitious in Upper Egypt. There were some very warm days which caused bolls to open prematurely ; moreover, some damage has been caused to bolls of the second picking and to those of the late crop by cool temperatures at night. Irrigation water has been adequate. Pink bollworm and bollworm have caused further damage and on the whole attacks by these two worms are above the normal in extent, compared with the same period of previous years. They have, in fact, reached during the first half of September, 63 % in the case of Sakellaridis and Achmuni in Lower Egypt and 42 % for the cottons of Upper Egypt. Picking is general but is proceeding slowly and with indifference except on the large plantations. Most planters pick at the same time the bolls of both the first and second pickings. In Upper Egypt, picking is nearly finished. Apart from Sakellaridis it is generally considered that the condition of the crop is not satisfactory. Ginning yields are lower than those obtained from the preceding crop.

The quantities of cotton ginned from 1 September 1931, the beginning of the Egyptian cotton season, to 30 September are as follows : 20,200 centals (4,200 bales) of Sakellaridis, 341,500 centals (71,400 bales) of other varieties, 361,700 centals (75,700 bales), total ; 6,300 centals (1,300 bales) of linters. The corresponding figures as on 30 September 1930, are respectively as follows : 40,300 (8,400) ; 701,000 (146,600) ; 741,300 (155,000) ; 9,900 (2,100). Figures for 30 September 1929 are : 68,400 (14,300) , 747,800 (156,400) ; 816,300 (170,800) ; 10,800 (2,300). On 30 September 1928, the respective figures were as follows : 147,000 (30,800) , 868,000 (181,500) ; 1,015,000 (212,300) ; 16,900 (3,500).

Kenya : In the coastal, central and lake Victoria area, cotton picking was general in August : in the districts of Mwanza and Shinganga it had already been finished. Damage by rats was reported in the district of Kufiji. Due to the low level of quotations, picking progressed slowly in the district of Morogoro.

Uganda : In August the weather was very wet and generally favourable to the growth of cotton, the crop condition of which at the beginning of September was, on the whole, satisfactory and such as to permit the forecast of yields above the normal. Here was beginning to be felt a need, however, for a period of dry weather to check the tendency excessive growth displayed by the crops after the exceptionally heavy rains and to permit the flowering of early-sown cotton.

The August sowings continued rapidly and at the end of the month in the two principal cotton producing provinces, namely, the Eastern Province and Buganda, the area sown had already reached 749,000 acres against 540,000 at the same date of last year.

FLAX

Seed : The total flax seed crop of the three principal non-European producing countries of the northern hemisphere is this year definitely deficient as a consequence of adverse weather conditions, which have greatly reduced yields both in the United States and in Canada. Although in India the results have been nearly normal, and the area sown to flax in the three countries considered is not greatly different from that of last year and the average of the preceding quinquennium, the quantity of flax seed obtained in them is about 30 % below that of last year and the average. To find a production lower than the present one, it is necessary to go back to 1921, in which year the flax area was greatly reduced and represented under 60 % of that harvested in 1931.

The area under flax and production of flax seed in Canada, the United States and India.

Year	Area 1,000 acres	Production		Year	Area 1,000 acres	Production	
		1,000 centals	1,000 bushels			1,000 centals	1,000 bushels
1920	6,289	19,897	35,531	1926	7,241	23,188	41,408
1921	3,912	12,846	22,940	1927	6,570	26,304	46,971
1922	4,688	18,381	32,824	1928	6,364	20,979	37,463
1923	6,000	25,496	45,529	1929	6,544	17,913	31,987
1924	8,470	33,466	59,761	1930	7,076	22,942	40,968
1925	7,615	27,867	49,763	1931	6,751	16,452	29,378

The data available for Europe (excluding the U. S. S. R.), are still very incomplete, but due to the almost general and considerable reduction of area, in this continent also production may be anticipated to be relatively small.

Moreover, in Argentina, the relative importance of which as a producer of linseed has steadily increased and which in recent years has alone furnished about one half of the world crop, the area sown to flax this year is the largest on record. The crop has been extended successively from 4,900,000 acres on the average for the quinquennium 1920-1924, to an average of 6,900,000 acres for the quinquennium 1925-29, to 7,510,000 acres in 1930 and to 8,345,000 this year. If there is a continuance of the rather favourable weather conditions which have so far prevailed, it is probable that the increase of production in Argentina will compensate the total reduction of crops in North America and Europe.

For the U. S. S. R., there is an absence of precise information of crop results, but the large increase in the area sown justifies the consideration that the production of this country will be considerably larger than that of last year and will exceed the average to a still greater extent.

For a complete judgement of the situation of world supplies it should, finally, be recollected that on October 12 there existed in Argentina no more than 2,490,000 centals (4,450,000 bushels) of exportable stocks of the old crop, while in 1930, exports from that country during the last quarter reached 6,162,000 centals (11,003,000 bushels).

* * *

Estonia : Yields are average but quality of the flax is particularly good.

Great Britain and Northern Ireland : In Northern Ireland the quality of the flax seed crop is regarded as fair. Scutching has commenced in some districts. (For weather conditions see "cereals").

U. S. S. R. : On October 5 the flax crop for fibre (Dolgunez variety) had been harvested from 96.4 % of the area sown in the present season. There still remain about 116,000 acres of flax to be pulled, principally in the Ural region and western Siberia.

On October 5, the flax stems obtained from about four-fifths of the area harvested had been spread out in the fields or retted.

According to the State plan on January 1, 1932 the first work on almost all the stems of this year's crop and stocks of the crop of 1930, which are considerable in some regions, especially western Siberia and the western region, should be completed.

Flax.

COUNTRIES	AREA					PRODUCTION							
			Aver.	% 1931				Aver.			Aver.	% 1931	
	1931	1930	1925	1930	Aver.	1931	1930	1925	1931	1930	1925	1930	Aver.
			to					to			to		
			1929	= 100	= 100			1929			1929	= 100	= 100
	1,000 acres					1,000 centals			1,000 pounds				

Fibre.

Germany.	16	27	49	59.8	33.4	(1)	117	—	—	11,684	—	—	—	—		
Austria †)	8	8	(2)	11	90.3	70.2	100	127	(2)	152	10,935	12,694	(1)	15,225	86.1	71.8
Belgium.	36	56	59	63.6	60.5	192	192	325	580	19,136	32,499	57,950	58.9	33.1	—	—
Bulgaria.	1	1	1	154.3	210.1	3	3	3	1	331	262	147	126.2	224.9	—	—
Estonia.	45	80	89	56.3	50.3	124	124	237	221	12,449	23,745	22,084	52.4	56.4	—	—
Finland (3). . . .	10	14	13	72.7	74.6	...	...	35	35	...	3,527	3,508	...	...	—	—
Northern Ireland	7	29	33	26.1	22.4	...	...	120	132	...	12,032	13,761	...	...	—	—
Hungary †)	44	36	7	123.0	—	...	...	869	—	...	36,913	—	...	...	—	—
Latvia (3)	104	123	163	81.1	63.7	331	331	424	487	33,036	42,395	48,714	78.0	67.9	—	—
Lithuania (3) . . .	124	204	211	60.5	53.5	...	...	642	802	...	64,183	80,199	...	...	—	—
Netherlands	16	37	37	43.2	43.2	82	82	230	253	8,234	22,957	25,346	35.9	32.5	—	—
Czechoslovakia . .	23	31	52	72.7	44.1	83	83	128	238	8,344	12,816	23,764	65.1	35.1	—	—
—																
U. S. S. R. (4) . .	5,733	4,278	3,271	134.0	175.8	...	...	9,449	7,064	...	944,904	706,425	...	...	—	—

*Linseed.*Thousand bushels
of 56 pounds.

*Germany.	16	27	49	59.8	33.4	(1)	73	—	—	(1)	130	—	—	—	—
Austria	5	5	8	90.9	59.8	18	18	19	27	32	34	49	94.1	65.8	
Belgium.	36	56	59	63.6	60.5	127	233	233	237	227	417	512	54.4	44.3	
Bulgaria.	1	1	1	154.3	210.1	4	4	4	2	8	7	3	119.5	244.5	
*Italy	24	27	44	90.6	55.5	...	...	125	206	...	223	368	...	...
Latvia (3)	104	123	163	81.1	63.7	326	410	410	452	532	733	808	79.4	72.0	
Czechoslovakia. .	23	31	52	72.7	44.1	72	94	202	128	169	361	75.7	35.3		
—															
*U.S.S.R.	7,735	5,553	4,267	139.3	181.3	...	...	13,255	...	...	23,670	...	...
Canada	599	532	563	103.0	106.4	1,544	2,463	2,553	2,758	4,399	4,558	62.7	60.5		
United States . .	3,132	3,692	2,909	84.8	107.7	6,440	11,967	11,713	11,500	21,369	20,917	53.8	55.0		
India	3,020	2,802	3,392	107.8	89.0	3,467	8,512	8,348	15,120	15,200	15,800	99.5	95.7		
—															
*Eritrea	2	—	10	—	21.2	9	—	38	16	—	68	—	23.1		
French Morocco .	67	58	48	116.1	140.3	411	251	229	734	448	408	184.0	179.9		
—															
*Argentina	58,345	57,511	56,916	111.1	120.7	...	39,348	41,099	...	70,265	73,391	...	...
Grand Total . . .	6,967	7,355	7,195	95.0	97.1	17,499	23,953	24,313	31,089	42,776	43,416	72.7	71.6		

†) Production expressed in dried flax straw. — * Countries not included in the total. — (1) Private estimate.
— (2) Average 1927 to 1929. — (3) Flax and hemp. — (4) Dolgunetz quality. — (3) Area sown.

Argentina: The second estimate of the area sown to flax substantially confirms the figure published in September, showing a slight increase of 140,000 acres.

By Decree at the end of August, the Ministry of Agriculture has provided for the distribution on credit to farmers for exclusive use as seed of 1,500 metric tons of flax seed, reserving a lien on the crop when produced. Rains in the last few days of August and the first half of September have favoured the growth of flax ; in the area south of

Buenos Aires only a few limited frosts have caused slight damage to the sowings. Mild temperatures are required for complete growth. — (Telegram of October 17) : The crop condition of flax is good. Weather conditions have so far favoured its development and germination has taken place regularly and uniformly. No important damage is reported.

HEMP

U. S. S. R. : On October 5, hemp had been harvested on an area representing 47.5 % of the total acreage sown to this crop in the Union in the present year

The quantity of hemp retted at this date represented about one-fifth of the quantity harvested.

Hemp.

COUNTRIES	AREA				PRODUCTION				
	1931	1930	Average 1925 to 1929	% 1931	1931	1930	Average 1925 to 1929	% 1931	
	1,000 acres			1930 = 100	1,000 pounds			1930 = 100	Aver- age = 100

Fibre.

Germany (1)	1	1	4	80.4	19.5	—	—	—	—	—
Austria	1	1	(2) 1	80.4	89.9	(3) 1,801	(3) 1,789	(3) 1,770	72.7	73.5
Bulgaria	12	9	10	129.2	119.0	4,189	3,584	3,028	116.9	138.3
Italy	161	214	236	75.2	68.5	...	201,400	222,033	...	...
Czechoslovakia . . .	21	15	26	134.0	78.7	10,888	8,959	16,436	121.5	66.2
U. S. S. R.	2,277	1,854	2,268	122.8	100.4	...	...	695,913	...	...
Syria	6	6	6	96.4	94.5	...	3,576	3,761	...	...

Hempseed.

Austria	(4) 12	(4) 9	1	82.9	61.5	154	198	266	78.0	58.1
Bulgaria	12	9	10	129.2	119.0	3,527	3,960	2,525	89.1	139.7
Czechoslovakia . . .	21	15	26	134.0	78.7	8,020	6,840	11,776	126.5	68.1
U. S. S. R.	2,277	1,854	2,268	122.8	100.4	...	...	1,220,963	...	...

(1) Hemp and other textile plants. — (2) Average 1927 to 1929. — (3) Dried fibre. — (4) Area under 500 acres.

OTHER PRODUCTS

Tea.

U. S. S. R. : Total area this year is 55,000 acres, an increase of 55.2 % on that of last year (35,000 acres) and an increase of 587.9 % on the average of the five years ending 1929 (8,000 acres).

India : In North India, the weather throughout the month of August was not favourable for growth and the crop outturn was poor. Statistics to the end of August recorded a decrease of 9 $\frac{3}{4}$ million lbs, as compared with the same period of last year.

In South India, heavy monsoon conditions prevailed and the crop was not very

satisfactory. Immediate prospects, however, are more favourable. The outturn to the end of August was 1 $\frac{1}{2}$ % below that to the same date of last year.

Japan : In September the crop condition of tea was rather bad due to the unfavourable weather conditions

Production of tea in 1930 was 85,202,000 lb., a decrease of 1.9% on that of the preceding year (86,846,000 lb.) and an increase of 3.7 % on the average of the five years ending 1928 (82,178,000 lb.).

Coffee.

Kenya : The August estimate of the coffee area shows a slight increase over that of July, passing from 99,150 to 99,600 acres, against 96,650 last year and 76,600, the average of the preceding five years ; percentages : 103.1 and 130.1. Due to unfavourable weather conditions and attacks of disease, however, the crop forecast was reduced in August from 180,000 to 160,000-170,000 centals against 311,000 in the preceding year and 208,000 on the average for the preceding quinquennium. A less approximate estimate of production will probably be available next month.

Madagascar : Area of coffee this year is 131,000 acres as last year, an increase of 22.9 % on the average of the five years ending 1925-26 to 1929-30 (107,000 acres). Production this year is 176,000 centals, an increase of 19.4 % on that of last year (148,000 centals) and an increase of 57 $\frac{5}{8}$ % on the average of the five years ending 1929-30 (112,000 centals).

Cacao.

Gold Coast : Harvesting of the main crop began later than usual and at first proceeded slowly in the majority of the districts. Owing to the recent rise in prices and the exchange situation there has been a tendency to suspend sales in the anticipation of a new rise. Due to weather conditions unfavourable to drying, harvesting has been further delayed except in the Eastern Province and the district of Kumasi. The first forecast of the main crop in the present season, which was considered to be slightly below the normal, is confirmed. Arrivals by rail at Takoradi and Accra during September have been below the average. Shipments amounted to 12,540,000 lb., giving a total of 486,370,000 lb. for exports by sea in the season 1 October 1930-30 September 1931.

Jute.

India : At the end of September jute harvesting was continuing and the condition of standing crops was satisfactory.

Groundnuts.

United States : Area of groundnuts for nuts this year is 1,337,000 acres, an increase of 23 % on that of last year (1,087,000 acres) and an increase of 22 % on the average of the five years ending 1929 (1,096,000 acres).

Production this year is 913,350,000 lb., an increase of 25.7 % on that of last year (726,745,000 lb.) and an increase of 14.8 % on the average of the five years ending 1929 (795,784,000 lb.).

Mexico : Crop condition in the producing States of the Centre is generally good, except in some small regions in which floods caused by the excessive rains at the end of August were responsible for scattered damage of small importance.

India : At the end of September groundnuts in Madras were in fair condition. In Bombay Presidency weather conditions varied greatly, rainfall being heavy in some areas and deficient in others.

Egypt : Crop condition of groundnuts on 1 October was estimated at 99 against 98 at the beginning of the preceding month and 100 on 1 October last year.

Rapeseed and Sesamum.

Austria : According to the recent estimate the production of rapeseed this year is 58,200 centals (116,400 bushels) in a decrease of 7.7 % on that of last year (63,100 centals; 126,100 bushels) and an increase of 43.0 % on the average of the five years ending 1929.

At the beginning of October the winter colza coverings were completely finished. Germination and growth took place under good conditions.

Hungary : At the beginning of the third week of October winter colza had come up uniformly and was making very good progress.

Netherlands : Production of rapeseed this year is 82,000 centals (163,000 bushels) a decrease of 28.5 % on that of last year (114,000 centals; 228,000 bushels) and a decrease of 34.5 % on the average of the five years ending 1929 (124,500 centals; 249,000 bushels).

Mexico : Crop condition of sesamum is generally good.

India : In the Punjab some damage was caused locally to rapeseed and sesame by excessive rains in the first half of September but at the end of the month crop condition varied, on the whole, from average to good. In Bengal floods occurred locally in the first half of the month; at the end of the month condition and prospects of standing crops were good. In Bihar and Orissa crops were in good condition at the end of September.

Palestine : Harvesting of sesame is completed on the plains and almost concluded in the hills. Threshing is in progress.

Syria and Lebanon : Area of sesamum this year is 10,900 acres, an increase of 9.7 % on that of last year (9,900 acres) and a decrease of 45.1 % on the average of the five years ending 1929 (19,800 acres).

Production this year is 43,900 centals (2,200 short tons) an increase of 11.4 % on that of last year (39,400 centals; 2,000 short tons) and a decrease of 50.5 % on the average of the five years ending 1929 (88,600 centals, or 4,400 short tons).

Crop condition at the end of September was considered good and estimated at 100, the same as at the end of the preceding month.

Tobacco.

Greece : According to unofficial data, this year's tobacco area is forecast at 196,000 acres against 244,000 in 1930. The decrease is due particularly to a reduction of the area sown as a result of the fall in tobacco prices during recent years.

The decrease of production this year is anticipated to be still larger, owing to the unfavourable weather conditions during the period of maturity. The provisional estimate is 90,629,000 lbs. against 138,191,000 in 1930 showing a decrease of 34 %. As regards quality, however, the crop is anticipated to be excellent.

Hungary : Tobacco picking is finished and curing has begun. Production is slightly above the average.

Tobacco.

COUNTRIES	AREA					PRODUCTION				
	1931	1930	Average 1925 to 1929	% 1931		1931	1930	Average 1925 to 1929	% 1931	
				1930 = 100	Aver. = 100				1930 = 100	Aver. = 100
1,000 acres					1,000 pounds					
*Germany.	26	23	21	112.1	119.8	..	46,409	44,112	...	..
Belgium.	7	7	7	100.0	97.2	12,739	15,387	15,334	82.8	83.1
Bulgaria.	74	78	83	95.2	89.8	52,911	52,826	60,580	100.2	87.3
*Czechoslovakia . .	22	18	14	125.7	157.4	...	22,095	16,342	...	..
—										
*U. S. S. R.	406	248	210	164.0	193.6	—	—	—	—	—
—										
United States . . .	2,096	2,117	1,787	99.0	117.3	1,661,000	1,641,437	1,357,127	101.2	122.4
—										
Japan	90	89	91	101.0	99.2	147,986	145,175	142,157	101.9	104.1
Syria and Lebanon .	22	10	7	220.3	295.0	14,220	6,960	4,959	204.3	286.7
—										
*Algeria	40	57	65	68.9	60.6	...	43,486	54,233	...	...
*Tripolitania	1	1	—	88.2	—	132	1,543 (1)	243	8.6	54.5
Totals . . .	2,289	2,301	1,975	99.4	115.9	1,888,856	1,861,785	1,580,157	101.4	119.5

*Countries not included in the totals. — (1) Average 1927 and 1928.

United States : Tobacco cutting was nearly finished by the end of September in most places.

Japan : Crop condition of tobacco was fairly good in September.

Palestine : Picking is almost completed. Curing is in progress. Good results have been obtained.

Algeria : Weather conditions are favourable and the tobacco is of good quality.

Hops.

Belgium : The hop crop is deficient and quality generally leaves something to be desired. In the Poperinghe region it is estimated that only half of the crop has been picked.

Hungary : Hop picking is finished and drying has begun. Quantitative results are only average.

Hops.

COUNTRIES	AREA					PRODUCTION				
	1931	1930	Average 1925 to 1929	% 1931		1931	1930	Average 1925 to 1929	% 1931	
				1930 = 100	Aver- age = 100				1930 = 100	Aver- age = 100
1,000 acres					1,000 pounds					
*Germany	25	32	36	79.6	70.5	..	24,386	16,111	...	...
Belgium	3	3	3	100.0	73.9	2,271	2,961	5,118	78.7	44.4
*England and Wales.	20	20	25	98.0	79.9	..	28,336	34,563	...	...
Czechoslovakia . .	31	38	36	80.5	86.2	24,725	32,464	21,520	76.2	114.9
—										
United States . . .	21	20	23	105.5	89.8	25,300	23,447	31,383	107.9	80.6
Totals. . .	54	61	62	87.5	87.5	52,296	58,872	58,621	89.1	96.1

* Countries not included in the totals.

Sericulture.

Italy: Leaf production this year is 31,804,000 centals a decrease of 2.4 % on that of last year (32,587,000 centals) and an increase of 3.7 % on the average of the five years ending 1929 (30,682,000).

Japan: In September the seasonal conditions for silkworms were bad.

Sericulture.

COUNTRIES	QUANTITIES OF EGGS PREPARED FOR INCUBATION					PRODUCTION OF COCOONS				
	1931	1930	Average 1925 to 1929	% 1931		1931	1930	Average 1925 to 1929	% 1931	
				1930 = 100	Aver. = 100				1930 = 100	Aver. = 100
1,000 ounces					1,000 pounds					
Bulgaria	20	44	40	45.8	50.4	2,648	4,995	4,388	53.0	60.3
Korea. s)	222	225	185	98.6	120.2	27,605	23,404	19,953	97.2	138.4
Japan {s)	2,807	2,790	2,560	100.6	109.6	435,419	463,825	386,033	93.9	112.8
Syria and Lebanon.	2,935	3,339	3,537	87.9	83.0	332,582	416,356	371,804	79.9	89.4
	81	106	96	76.7	84.6	6,206	8,047	6,844	77.1	90.7
Total . . .	6,065	6,504	6,418	93.2	94.5	804,438	921,627	789,922	87.3	102.9

s) Spring Cocoons. — t) Summer-autumn cocoons.

FODDER CROPS

In almost the whole of Europe, excluding the southern zone of Italy and the Balkan peninsula, weather conditions during September were very changeable, with rather frequent rains and considerable fluctuations of temperature, which, in part of the month, was considerably below the normal. Such weather conditions were on the whole favourable to fodder crops, especially in the meadows and pastures, except in the rather elevated areas of central Europe where the excessive rain and especially the low temperatures had an unfavourable influence. Moreover, in some countries (for example, England), the lack of warmth during the months of August and September and the unfavourable conditions in the preceding month have resulted in a production of fodder roots this

year notably below that of last year and the preceding quinquennium. In some countries (such as Germany), the carting of second crop hay was hindered by rain. In Africa, rains in Algeria and Tunis were favourable to fodder crops. In North America, rainfall in September over large parts of the United States and Canada was favourable to the crops. In the United States the new estimate of production of meadow hay indicates a crop slightly larger than that of last year, but notably below that of the preceding quinquennium ; production of hay from permanent meadows and alfalfa is below that of last year and the five-year average. In Canada, on the contrary, the latest estimate confirms the favourable forecasts of production of alfalfa and turnips and is rather unfavourable for fodder maize. In Argentina, rains at the end of August and in the first half of September were beneficial to the meadows and pastures.

I G.

Germany : Mangolds have in general developed satisfactorily. The second cutting of hay was carted under great difficulties. Yields are satisfactory as regards quantity but quality suffered from frequent rains.

According to the first estimate the production of fodder beet this year is 633,646,000 centals (31,682,000 short tons) a decrease of 5.5 % on that of last year (670,256,000 centals ; 33,512,000 short tons) and an increase of 20.7 % on the average of the five years ending 1929 (524,997,000 centals ; 26,249,000 short tons).

Austria : Rainy weather in September was rather favourable to the growth of fodder crops, but on the other hand, considerably checked the crop, the quality of which deteriorated. Crop condition of mangolds is a little better than it was at the beginning of September. Beet sown on stubble have not developed well due to the lack of warmth. On the meadows yielding two cuttings there is still a large quantity of grass which has not been cut due to the changeable weather. The pastures are still green, especially in the valleys. Crop condition of mixed fodder and vetches at the beginning of October was 2.9 against 3.0 on September 1 this year and 2.8 on October, 1, 1930 ; the corresponding figures for green fodder maize were 2.5 ; 2.4 ; 2.3.

Belgium : The larger part of the aftermath and the second cuttings of clover and alfalfa have been stored under fairly good conditions ; yields are average. Mangolds are a good normal crop.

Estonia : Production of hay from temporary meadows is less abundant than last year but that of permanent meadows is more abundant. The hay is of good quality.

Irish Free State : The weather during September was almost uninterruptedly genial and dry. All root crops made reasonable progress, but not sufficient to overtake the retarding effects of the inclement conditions which prevailed earlier in the year. It is anticipated that yields of all root crops will be below the average. "Finger and toe" disease in turnips was more than usually in evidence ; otherwise no serious injury was caused by pests or disease.

The hay crop was saved in good condition. The yield generally was well above the average and the quality good. Ample supplies are available for feed during the winter. With regard to fodder grain, yields are rather under the average but quality is good and there is a good bulk of straw.

France : The harvest is giving rise to anticipations of poor yields of fodder seeds. Favoured by fine weather considerable progress was made in the cutting of fodder crops at the beginning of the present month.

The Condition of Fodder Crops.

CROPS AND COUNTRIES	Crop Condition (†)								
	October 1, 1931			September 1, 1931			October 1, 1930		
	a)	b)	c)	a)	b)	c)	a)	b)	c)
CLOVER *									
Germany	2.6	—	—	2.7	—	—	2.4	—	—
Austria (1)	2.8	—	—	2.8	—	—	2.3	—	—
ALFALFA *									
Germany	2.6	—	—	2.5	—	—	2.4	—	—
Austria	2.8	—	—	2.8	—	—	2.7	—	—
MANGOLDS :									
Germany	2.5	—	—	2.5	—	—	2.4	—	—
Austria	2.4	—	—	2.5	—	—	2.4	—	—
Bulgaria	160	—	—	160	—	—	200	—	—
Finland (2)	—	—	97	—	—	85	—	—	—
Lithuania	110	—	—	113	—	—	—	—	—
Norway (2)	—	—	88	—	—	92	—	—	93
Sweden	—	—	97	—	—	—	—	—	—
TEMPORARY MEADOWS									
Austria (3)	2.7	—	—	2.7	—	—	2.4	—	—
Bulgaria	110	—	—	110	—	—	115	—	—
Finland	—	—	88	—	—	88	110	—	—
Norway	103	—	—	—	—	99	108	—	—
Sweden	116	—	—	116	—	—	115	—	—
PERMANENT MEADOWS :									
Germany { irrigated meadows.	2.5	—	—	2.3	—	—	2.2	—	—
{ other meadows	2.8	—	—	2.6	—	—	2.5	—	—
Austria	—	3.0	—	2.8	—	—	2.6	—	—
Bulgaria	150	—	—	150	—	—	150	—	—
Finland	—	—	95	—	—	99	—	—	90
Sweden	—	—	93	—	—	97	—	—	—
PASTURES :									
Austria	—	—	3.2	—	3.0	—	2.9	—	—
Canada	—	—	—	—	—	91	—	—	91

a) above the average. — b) average. — c) below the average. — (†) See explanation of various systems page 579.—
 (1) Red clover. — (2) Turnips. — (3) Klee-gras.

Great Britain and Northern Ireland: In England and Wales, grass continued to make abundant growth during September and pasturage almost everywhere was more than sufficient for the stock carried.

Notwithstanding heavy aftermath, very few second cuts for hay were taken owing to the abundant and protracted harvesting of the first crop.

Although showing some improvement during September, root crops have suffered from the almost continuous lack of sunshine and warmth throughout the season, and the prevalence of weeds and the difficulty of cleaning the crops has affected the development

of the bulbs. The yield of mangolds, on October 9, was expected to be 16.6 long tons per acre compared with a ten-year average of 19.1. Turnips and swedes were forecasted to yield 11.2 tons per acre or 1.1 tons below the ten year average.

In Scotland, pastures and root crops suffered from a scarcity of rain in September, and in exposed areas grasslands became rather bare. Turnips have not bulbed so well as usual.

Estimates of production of mangolds and turnips respectively in England and Wales this year are 100,956,000 centals (5,048,000 short tons) and 155,814,000 centals (7,791,000 short tons), corresponding productions in 1930 were 121,878,000 (6,094,000) and 177,587,000 (8,879,000) and the respective averages for 1925-29 139,508,000 (6,975,000) and 210,865,000 (10,543,000). Percentages: mangolds 82.8 and 72.4 and turnips: 87.7 and 73.9.

In Northern Ireland, mangels have improved during the month, but as a result of late sowings followed by a wet season the crop still remains in a backward state. Early sown fields of turnips are looking well and promise to give good yields of roots, but the late sown crops are very backward despite the improvement during the past month. Generally, turnip crops are much below normal and those on low lying areas will be particularly poor.

The quality of this year's hay crop is generally only fair.

While very early cut crops were well saved, those cut in late June and early July were damaged by rain and the quality is accordingly lowered. The yield of "seeds" hay is well up to the average. Meadow and late saved hay gave a heavy crop and is on the whole of good quality. It is estimated that the total yield this year will exceed the average. Large supplies of fair to good quality hay are available on most farms. It is also reported that an increased acreage of hay has been seeded this year.

Pasture lands are in good condition. The warm, moist weather during the past two months, quickened growth and there is still plenty of keep in evidence in the fields. The aftermath was exceptionally good this year in most districts.

Hungary: All the fodder crops have profited by the rains which fell before October 10. At this period it was possible to effect the last cutting of clover and alfalfa. Growth of the meadows and pastures was vigorous and furnished sufficient feed for livestock.

Italy: In the first half of September, sowing of autumn-winter meadows and the last cuttings of meadows continued. Pastures, which benefited by the rains, began to green; fodder shortage was reported in many areas. In the latter half of the month, the meadows and pastures benefited by timely rainfall. Sowings of meadows and fodder pulses continued.

Latvia: The area of permanent meadows in 1931 was 2,199,000 acres, or about the same as that of last year and production reached 42,734,000 centals (2,137,000 short tons) against 38,055,000 (1,903,000) last year; increase, 12.3%.

The corresponding figures for clover, vetches and other grasses on arable land are: area: 1,271,000 acres against 1,153,000; increase 10.3%; production: 34,946,000 (1,747,000) against 35,436,000 (1,772,000), decrease 1.4%.

Lithuania: Conditions in September were not altogether favourable to the growth of fodder crops.

Norway: The area under turnip cabbage in 1931 was 10,400 acres against 10,000 in 1930. Increase: 4.0%. Production amounted to 3,023,000 centals (151,000 short tons) against 3,239,000 (162,000) in 1930. Decrease: 6.7%. Corresponding figures

for permanent meadows are: Area : 436,000 acres ; 447,000 acres (— 2.4 %). Production (hay) : 9,629,000 centals (481,000 short tons), 10,366,000 (518,000) (— 7.1 %).

Netherlands : Recently it has been too cold for the good growth of grass, particularly on sandy lands. Livestock will probably have to be stabled earlier than usual. Due to the rain little hay of the last cutting has been harvested but a fair quantity has been placed in silos.

Sweden : Area of fodder roots this year is 251,000 acres, a decrease of 2.3 % on that of last year (256,000 acres) and an increase of 10.4 % on the average of the five years ending 1929 (227,000 acres).

Production this year is 68,123,000 centals (3,406,000 bushels) a decrease of 20.5 % on that of last year (85,660,000 centals, 4,283,000 short tons) and an increase of 0.1 % on the average of the five years ending 1929 (68,074,000 centals ; 3,404,000 short tons).

Canada : Production of some of the chief fodder crops this year is as follows :

	1931	1930	Av. 1929-29	% 1930 = 100	Av. = 100
	—	—	—	—	—
Turnips, etc. (ooo centals)	46,883	41,064	37,520	114.2	125.0
(ooo sh. tons)	2,344	2,053	1,876		
Fodder maize (ooo centals)	63,520	69,514	78,871	91.4	80.5
(ooo sh. tons)	3,176	3,476	3,944		
Alfalfa (ooo centals)	42,660	32,800	38,581	130.1	110.6
(ooo sh. tons)	2,133	1,640	1,929		

United States : Rains in the last week of September were beneficial to pastures and ranges from the Lake region westward to Idaho but in much of the northern Great Plains pasturage was still poor, though improving. More moisture would have been helpful in much of the South from Texas and Oklahoma eastwards to Virginia. The southern Rocky Mountain region was still in satisfactory condition but the great Basin and much of the more western States still needed rain.

The estimate of production of tame hay has been raised slightly since last month to 1,586,000,000 centals (79,300,000 short tons) this being above last years figure by 1.9 % and below the average by 16 %. Corresponding figures for wild hay and alfalfa are respectively 182,000,000 centals or 9,100,000 short tons (— 23 % and — 30.3 %) and 510,000,000 centals or 25,500,000 short tons (— 10.9 % and — 13.1 %).

LIVESTOCK AND DERIVATIVES

Condition of Livestock and Dairy Production.

Estonia : As regards fodder supplies, livestock rearing is in a better situation than last year.

Irish Free State : Milk yields have suffered the usual seasonal decline. The fodder situation is dealt with under the heading of "fodder crops".

Great Britain and Northern Ireland : In England and Wales milk yields, though showing a seasonal tendency to fall, have been on the whole well maintained.

In Scotland the milk yield has been maintained but hand feeding was generally

necessary in September. Fodder supplies are plentiful. Ample supplies of concentrated feeding stuffs are available but prices generally tend to rise.

In Northern Ireland the favourable weather conditions in the last two months were beneficial to livestock, which have thriven well and are generally in a good state of health. The milk yield has fallen slightly but is still quite normal for the time of the year. (For weather and feed conditions see "cereals" and "fodder crops").

Argentina: With the object of facilitating purchases of good breeding animals, the Rural Society of Argentina has obtained from the "Banco de la Nación", special loans for livestock raisers at 7% interest for the term of one year by granting the Bank a lien on prize stock purchased. Livestock are in good condition. There is also a general intensification of rearing of horses, which many farmers today still tend to use for reasons of economy in agricultural work. In the province of Buenos Aires, especially in some zones of the centre and the southwest, and in that of Entre Rios, poultry rearing is in full development, favoured by the abundance of maize, which is used almost exclusively as feed. — (Telegram of October 17): Livestock are in good health and breeding conditions are excellent.

Canada: In the following table is given the total production of milk in Canada and data of the quantities of milk converted into factory or home-made butter or cheese together with the actual production of the latter products.

PRODUCTS	1930	1929	1928	1927	1926
	(000 lbs.)				
Milk production	14,759,657	14,349,023	14,512,898	14,825,821	14,591,873
Milk made into butter (in factories)	4,381,210	3,998,687	3,983,513	4,148,077	4,148,469
" " " " (home made)	1,974,830	2,080,080	2,106,900	2,228,950	2,223,950
" " " " cheese (in factories)	1,331,898	1,329,959	1,619,348	1,546,237	1,923,394
" " " " (home made)	5,400	5,490	4,873	4,653	5,788
" " " " miscellaneous factory products	811,487	307,725	296,254	287,417	254,072
" " " " consumed fresh or otherwise used	6,765,332	6,647,102	6,552,010	6,620,487	6,036,200
Butter produced (in all factories)	187,151	170,810	168,027	178,979	177,209
" " " " (home made)	84,337	88,000	90,000	95,000	95,000
Cheese	118,920	118,746	144,585	138,057	171,782
" " " " (home made)	483	490	435	415	517

Milk production was well maintained in 1930; the most noteworthy feature is the increase in production of factory butter, miscellaneous factory products and milk consumed fresh, and the decrease in home made butter.

Algeria: Livestock are finding abundant feed on the pastures and weather conditions are very favourable.

The number of pigs in Germany in September.

The number of pigs in Germany on September 1 reached a record figure greatly exceeding the maximum of the previous year and the number as on December 1, 1913. In comparison with the number of September 1, 1930 there is an increase in sucking pigs and young pigs up to 6 months old, whereas for young brood sows there is a large increase which is not compensated for by the increased number of older brood sows. Although the tendency to decline in farrowings is quite marked, the number of brood-sows in general and that of sows in farrow, in particular, still remains larger than in September, 1929.

Numbers of pigs in Germany (1).

CLASSIFICATION BY SEX AND AGE	1 Sept. 1931	1 June 1931	2 March 1931	1 Dec. 1930	1 Sept. 1930	2 June 1930	1 March 1930	2 Dec. 1929	2 Sept. 1929	1 June 1929	1 Dec. 1928	1 Dec. 1913(1)
(1000 head).												
Totals	25,348	22,528	21,790	23,365	23,423	19,805	18,649	19,944	19,604	16,795	20,106	22,533
Sucking pigs under 8 weeks of age	6,801	6,027	5,750	5,440	6,522	5,091	5,012	4,417	5,373	4,160	4,003	13,350
Young pigs from 8 weeks to 6 months of age . .	10,980	10,350	10,231	10,003	9,809	9,178	8,555	8,693	8,290	8,099	8,487	
Pigs from 6 months to 1 year of age	5,391	4,172	3,939	5,470	5,125	3,342	3,487	4,599	4,288	3,060	5,129	6,677
Of which :												
Boars for service . . .	51	54	58	67	57	57	54	56	50	48	53	—
Sows for breeding (total)	569	693	706	673	812	876	722	663	652	671	556	—
Sows covered	(276)	(409)	(425)	(368)	(442)	(574)	(455)	(383)	(363)	(405)	(312)	—
Other swine	4,771	3,424	3,176	4,730	4,256	2,909	2,712	3,880	3,585	2,341	4,520	—
Pigs, 1 year old and over.	2,173	1,979	1,870	2,451	1,967	1,694	1,695	2,235	1,653	1,475	2,487	2,506
Of which												
Boars for service . . .	73	71	62	62	61	57	51	50	58	55	52	—
Sows for breeding (total)	1,661	1,663	1,517	1,496	1,467	1,356	1,229	1,179	1,208	1,145	1,063	—
Sows covered	(902)	(921)	(927)	(861)	(939)	(915)	(792)	(775)	(737)	(787)	—	—
Other swine	439	246	291	893	440	280	315	1,006	387	275	1,372	—

(1) Present territory, excluding the Saar.

Poultry in England and Wales.

The figures in the following table were compiled from the returns furnished as on June 4th, 1931 by occupiers of agricultural holdings exceeding one acre in extent.

Year	Fowls under 6 months old on 4th June	Fowls over 6 months old on 4th June	Total Fowls	Ducks	Geese	Tur- keys
—	—	—	—	—	—	—
Thousand head						
1931	28,989	23,572	52,561	2,500	552	543
1930	26,460	21,441	47,901	2,383	604	667
1929	22,424	20,333	42,757	2,243	616	696
1928	20,344	19,572	39,916	2,507	620	593
1927	21,172	18,319	39,491	2,797	653	604
1921	13,114	11,702	24,816	2,391	517	445
1913	15,291	13,735	29,026	2,188	577	652

From the table it may be noted that the number of fowls has about doubled since the war while that of ducks has fluctuated round 2,500,000 head, that of geese has declined since 1927 and that of turkeys has varied greatly, with a recent tendency to fall.

In 1931 the numbers of both young and adult fowls showed a further increase of about 10 % for each class compared with the previous year. The increase was relatively greatest in the Eastern division, which showed additions to the number of adult birds equivalent to 15 % and to young birds, 14 %.

Ducks increased in 1931 by about 5 % the increase being greater for young ducks (7 %) as compared with older birds (1.5 %). The greatest increase in the number of young ducks was that in the North Eastern division of 51,000 (16 %) to which Norfolk alone contributed 38,000 (18 %).

The large decline in the number of geese in 1931 was distributed fairly generally over the country being particularly marked in the North Eastern (13 %), Northern (11 %), South Western (11 %) and South Wales (10 %) divisions

The number of turkeys on 4th June 1931 was the lowest since 1921 and showed a large reduction of 124,000 head (19 %) compared with 1930. The heaviest decreases took place in Norfolk (23 %), Suffolk (23 %), Yorkshire (15 %) and Devon (26 %)

Livestock in Norway.

In the following table are given the numbers of livestock in Norway during the last nine years.

Year	Horses	Cattle	Sheep	Goats	Pigs
1931	176,823	1,309,656	1,692,406	344,352	317,343
1930	176,898	1,250,672	1,588,186	333,141	338,859
1929	177,169	1,224,182	1,533,015	323,677	289,039
1928	182,401	1,220,875	1,654,448	293,258	282,709
1927	183,365	1,209,450	1,608,222	290,099	299,669
1926	183,342	1,200,279	1,595,237	290,279	303,412
1925	183,887	1,150,617	1,528,819	275,783	252,959
1924	185,935	1,114,433	1,506,850	258,767	249,022
1923	193,157	1,131,120	1,525,281	241,753	237,302

It is seen from this table that the number of horses, which has decreased uninterruptedly since 1931, remained stationary in 1931

The increase in the number of pigs, having reached its maximum in 1930, gave way to a slight decrease compared with 1930 (— 6.3 %); the figure for 1931, however, still exceeds that of 1923 by 34 %.

All the other kinds of livestock are increasing: cattle, by 4.7 % compared with 1930 and by 15.8 % compared with 1923; sheep, by 6.6 % (105,000 head) in comparison with 1930 and by 11 % over 1923. The increase in the number of goats is regular and continued; the figure for 1931 is the highest recorded in the last decade; it exceeds that of last year by 3.4 % and is a more than 42 % above that of 1923.

Woolled Sheep in Union of South Africa.

The Departmental estimate of the woolled sheep numbers as at 30th June, 1931, upon which was based the estimate of wool production published in the Institute's September Report, shows an increase of 2,100,000 in comparison with the figures for the previous year and an increase of 5,500,000 on the numbers as at the 30th June, 1929

LATEST INFORMATION

United States: In a telegram dated October 22, the Department of Agriculture communicates that the growth of early winter wheat sowings is good but that conditions are unfavourable for sowings in some parts of the country. Harvesting of maize and cotton is well forward.

India: According to data of the second report transmitted by telegram from the Government of India on October 22, the sesame area is 3,500,000 acres, against 3,642,000 in 1930 and 3,336,000 on the average for the previous quinquennium; percentages: 96.1 and 104.9. Corresponding figures of the second report for sugar cane are: 2,817,000 acres, 2,610,000 acres and 2,692,000 acres; percentages: 107.9 and 104.6.

TRADE

COUNTRIES	AUGUST				TWELVE MONTHS (August 1-July 31)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1931	1930	1931	1930	1930-31	1929-30	1930-31	1929-30	1929-30	1929-30
Wheat. — Thousand cents (1 cental = 100 lbs)										
<i>Exporting Countries:</i>										
Bulgaria	238	410	0	0	3,234	66	0	930	—	—
Hungary	655	836	0	0	5,247	9,943	0	0	—	—
Lithuania	0	4	0	0	538	55	4	2	—	—
Rumania	—	—	—	—	8 675	1,279	7	40	—	—
U S S R	—	—	—	—	(3) 64,560	(3) 4 429	—	—	—	—
Yugoslavia	2,608	1,120	0	0	3,247	13,298	0	2	—	—
Canada	7 145	10,584	9	0	137,150	98,461	79	602	—	—
United States	5,346	11,188	800	511	46,355	57,253	11,616	7,835	—	—
Argentina	3,086	1,903	—	—	71,033	86,889	—	—	—	—
Chile	—	—	—	—	428	481	0	0	—	—
India	30	980	176	71	2,216	2,692	6,581	3,931	—	—
Turkey	9	15	0	0	265	24	7	414	—	—
Algeria	—	—	—	—	(1) 5,315	(1) 2,535	(1) 540	(1) 525	—	—
Tunis	752	624	20	7	3,701	3,862	542	99	—	—
Australia	3,611	2,057	0	0	76,505	24,469	0	0	—	—
<i>Importing Countries:</i>										
Germany	81	2	1,019	1,973	265	2,293	18,805	31,725	—	—
Austria	0	51	379	201	86	68	5,315	6,457	—	—
Belgium	487	7	2,760	2,727	2,079	865	30,082	25,794	—	—
Denmark	0	2	397	238	35	128	4 877	2,908	—	—
Spain	0	0	0	0	4	11	0	2,152	—	—
Estonia	0	0	87	49	0	0	370	540	—	—
Irish Free State	—	—	—	—	18	0	6,435	5,547	—	—
France	2	842	5,708	2,293	968	3,907	48,604	20,020	—	—
Gr. Brit. and N. Ir.	68	95	13,179	9,010	683	1,482	124,551	114,043	—	—
Greece	0	0	1,058	1,087	0	0	14,233	12,389	—	—
Italy	0	0	589	2,778	22	4	50,116	27,150	—	—
Latvia	0	0	44	179	0	0	1,019	1,523	—	—
Norway	—	—	123	276	—	—	3,126	2,216	—	—
Netherlands	7	2	935	1,404	633	231	16,599	14,921	—	—
Poland	55	11	2	15	1,847	239	49	331	—	—
Portugal	—	—	289	46	—	—	1,316	3,732	—	—
Sweden	0	7	201	295	31	1,003	2,879	4,982	—	—
Switzerland	0	0	1,034	935	2	0	11,096	9,590	—	—
Czechoslovakia	0	0	968	683	4	105	7,079	3,605	—	—
Japan	—	—	734	425	—	—	15,311	10,922	—	—
Syria and Lebanon	—	—	—	—	137	20	44	146	—	—
Egypt	—	—	—	—	2	13	1,019	24	—	—
Union of South Africa	—	—	—	—	(3) 0	(3) 0	(3) 1,503	(3) 1 653	—	—
New Zealand	—	—	—	—	0	130	123	170	—	—
Totals	24,190	30,768	30,509	25,512	435,338	315,761	381,937	316,875	—	—
Rye. — Thousand cents (1 cental = 100 lbs)										
<i>Exporting Countries:</i>										
Germany	22	487	75	13	1,213	10,529	690	1,922	—	—
Bulgaria	101	79	0	0	1,413	9	0	0	—	—
Hungary	115	110	0	0	1,579	2,919	0	0	—	—
Poland	161	1,021	0	0	5,880	7,293	2	20	—	—
Rumania	—	—	—	—	1,239	377	0	0	—	—
Czechoslovakia	0	60	278	9	476	1,325	844	254	—	—
U. S. S. R	—	—	—	—	(4) 11,023	(4) 1,268	—	—	—	—
Yugoslavia	—	0	0	0	0	33	4	0	—	—
Canada	82	13	0	0	1,171	194	0	150	—	—
United States	4	9	—	—	90	1,378	—	—	—	—
Argentina	51	53	—	—	1,003	767	—	—	—	—
Turkey	44	57	0	0	368	168	0	31	—	—
Algeria	—	—	—	—	(1) 35	(1) 31	(1) 0	(1) 4	—	—
<i>Importing Countries:</i>										
Austria	0	2	86	95	9	2	2,205	2,857	—	—
Belgium	13	4	220	161	126	7	3,739	983	—	—
Denmark	0	0	465	509	4	2	7,324	6,153	—	—
Estonia	0	0	4	9	0	0	194	1,920	—	—
Finland	0	0	73	134	2	4	1,570	3,314	—	—
France	0	0	53	93	0	7	1,378	181	—	—
Italy	0	0	7	62	0	0	597	324	—	—
Latvia	0	0	13	115	0	7	260	2,194	—	—
Lithuania	0	9	0	0	163	86	0	24	—	—
Norway	0	0	300	223	0	0	3,023	3,605	—	—
Netherlands	49	4	414	476	791	90	6,323	2,906	—	—
Sweden	0	0	35	55	4	11	520	2,240	—	—
Switzerland	0	0	11	13	0	0	174	154	—	—
Totals	642	1,998	2,034	1,972	26,539	26,597	28,847	29,236	—	—

(1) (3) (4) See notes page 642.

COUNTRIES	AUGUST				TWELVE MONTHS (August 1-July 31)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1931	1930	1931	1930	1930-31	1929-30	1930-31	1929-30	1929-30	1929-30
Wheat flour. — Thousand centals (1 cental = 100 lbs.).										
<i>Exporting Countries:</i>										
Germany	2	46	22	24	128	1,226	238	710	—	—
Belgium	4	11	11	15	216	265	231	573	—	—
Bulgaria	24	7	0	0	220	7	0	0	—	—
Spain	2	0	0	0	75	66	0	0	—	—
France	851	412	40	53	7,350	3,790	569	392	—	—
Hungary	95	430	0	0	4,005	5,064	0	0	—	—
Italy	132	64	18	13	1,179	1,400	225	93	—	—
Latvia	0	15	0	0	73	42	2	2	—	—
Poland	24	22	0	2	615	154	24	35	—	—
Rumania	0	0	0	0	427	317	0	0	—	—
Yugoslavia	0	0	0	0	88	820	2	2	—	—
Canada	1,023	1,204	2	7	13,113	13,285	49	143	—	—
United States	1,254	2,405	—	—	23,164	23,203	2	2	—	—
Argentina	119	132	—	—	1,880	2,604	—	—	—	—
Chile	—	—	—	—	104	203	—	18	—	—
India	66	71	0	0	1,014	1,113	2	2	—	—
Turkey	0	2	0	0	20	7	11	75	—	—
Japan	245	170	11	49	3,472	2,804	212	379	—	—
Algeria	—	—	—	—	(1) 234	(1) 93	(1) 37	(1) 46	—	—
Tunis	29	24	0	0	251	159	11	4	—	—
Australia	847	1,043	0	0	10,404	9,185	0	0	—	—
<i>Importing Countries:</i>										
Austria	2	0	15	68	13	4	8,100	8,761	—	—
Denmark	0	7	106	123	24	31	1,572	1,433	—	—
Estonia	0	0	4	11	2	0	88	123	—	—
Irish Free State	—	—	—	—	40	40	3,636	3,053	—	—
Finland	—	—	170	203	—	—	2,150	2,487	—	—
Gr. Britain and N. Ir.	395	362	904	1,318	4,608	4,727	12,816	12,487	—	—
Greece	—	—	9	22	—	—	165	494	—	—
Norway	0	0	165	154	2	2	1,396	1,376	—	—
Netherlands	2	13	104	282	115	203	3,854	2,760	—	—
Portugal	—	—	13	18	—	—	218	152	—	—
Sweden	0	2	2	18	2	90	71	373	—	—
Czechoslovakia	0	2	24	192	11	13	2,432	3,333	—	—
Ceylon	—	—	42	62	—	—	445	430	—	—
Java and Madura	—	—	—	—	—	—	1,025	1,142	—	—
Indo-China	—	—	26	37	—	—	428	522	—	—
Syria and Lebanon	—	—	—	—	22	0	168	425	—	—
Egypt	—	—	—	—	0	4	9,560	4,720	—	—
Union of South Africa	—	—	—	—	(3) 11	(3) 26	(3) 265	(3) 472	—	—
New Zealand	—	—	—	—	2	4	234	181	—	—
Totals	5,116	6,481	1,688	2,671	72,903	72,551	39,288	42,915		
Barley. — Thousand centals (1 cental = 100 lbs.).										
<i>Exporting Countries:</i>										
Bulgaria	66	216	0	0	1,598	309	0	0	—	—
Spain	2	11	0	0	152	163	0	9	—	—
Hungary	2	22	0	0	580	2,363	4	0	—	—
Lithuania	0	4	0	0	15	143	0	0	—	—
Poland	13	141	0	0	2,798	5,794	0	2	—	—
Rumania	—	—	—	—	32,778	31,365	0	0	—	—
Czechoslovakia	4	00	0	0	3,003	2,513	4	15	—	—
U. S. S. R.	—	—	—	—	(4) 22,966	(4) 9,137	—	—	—	—
Yugoslavia	4	7	0	13	29	282	130	159	—	—
Canada	1,576	0	0	—	9,240	1,250	0	9	—	—
United States	472	549	—	—	5,022	8,774	—	—	—	—
Argentina	99	298	—	—	5,501	2,575	—	—	—	—
Chile	—	—	—	—	536	897	0	0	—	—
India	2	0	0	0	302	26	2	11	—	—
Syria and Lebanon	—	—	—	—	869	503	7	20	—	—
Turkey	139	18	0	0	593	51	0	7	—	—
Algeria	—	—	—	—	(1) 1,378	(1) 2,013	(1) 225	(1) 126	—	—
Egypt	—	—	—	—	2	64	152	40	—	—
Tunis	99	53	26	44	220	2,652	390	53	—	—
Australia	71	159	0	0	1,552	324	0	0	—	—
<i>Importing Countries:</i>										
Germany	0	20	500	516	62	1,089	17,906	49,785	—	—
Austria	0	0	71	86	0	9	2,077	1,653	—	—
Belgium	71	13	531	401	1,076	176	10,538	7,857	—	—
Denmark	0	0	734	650	1,232	1,232	15,007	4,453	—	—
Estonia	—	—	0	0	—	—	13	73	—	—
Irish Free State	—	—	—	—	—	—	26	454	—	—
France	0	2	390	99	22	348	7,716	1,437	—	—
Gr. Britain and N. Ir.	0	0	1,292	944	68	33	18,691	14,454	—	—
Greece	—	—	0	4	—	—	79	401	—	—
Italy	0	0	15	37	0	9	787	375	—	—
Latvia	0	0	2	7	0	0	212	123	—	—
Norway	0	0	0	7	0	0	1,078	752	—	—
Netherlands	7	20	077	511	591	487	14,720	7,917	—	—
Switzerland	0	0	35	165	0	0	2,829	1,918	—	—
Totals	2,636	1,622	4,332	3,484	92,205	74,662	93,021	91,982		

(1) (3) (4) See notes page 642.

COUNTRIES	AUGUST				TWELVE MONTHS (August 1-July 31)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1931	1930	1931	1930	1930-31	1929-30	1930-31	1929-30	1929-30	1929-30
Oats. — Thousand centals (1 cental = 100 lbs).										
<i>Exporting Countries:</i>										
Germany	0	121	97	4	220	15,245	1,005	620	—	—
Irish Free State	—	—	—	—	234	661	452	115	—	—
Hungary	0	2	0	0	13	728	141	0	—	—
Lithuania	0	31	0	0	81	179	0	0	—	—
Poland	2	51	0	0	137	1,503	0	66	—	—
Rumania	—	—	—	—	1,739	1,831	0	0	—	—
Czechoslovakia	18	57	44	2	710	1,345	143	123	—	—
U. S. S. R.	—	—	—	(4)	9,513 (4)	1,008	—	—	—	—
Yugoslavia	0	0	0	53	2	9	56	51	—	—
Canada	256	53	57	40	2,630	679	234	1,132	—	—
United States	71	15	0	0	130	1,376	195	40	—	—
Argentina	776	317	—	—	14,431	6,508	—	—	—	—
Chile	—	—	—	—	2,178	622	0	0	—	—
Algeria	—	—	—	—	1,036 (1)	340 (1)	126 (1)	119	—	—
Tunis	55	104	0	0	545	855	9	0	—	—
<i>Importing Countries:</i>										
Austria	0	0	90	88	2	2	2,227	2,707	—	—
Belgium	0	0	212	260	4	4	3,494	2,773	—	—
Denmark	4	0	106	77	20	20	1,270	2,800	—	—
Estonia	0	0	0	2	0	0	159	106	—	—
Finland	0	0	13	15	7	0	260	476	—	—
France	0	2	161	90	20	77	2,213	1,671	—	—
Gr. Brit. and N. Irel. . .	4	11	827	414	397	306	10,667	9,653	—	—
Greece	—	—	0	0	—	—	0	207	—	—
Italy	0	0	150	196	0	0	3,741	1,700	—	—
Latvia	0	0	0	4	4	163	57	99	—	—
Norway	0	0	40	0	4	2	4	170	—	—
Netherlands	4	7	86	205	373	185	3,609	3,728	—	—
Sweden	0	7	223	46	40	60	1,334	1,290	—	—
Switzerland	0	0	390	317	2	0	4,564	4,385	—	—
Australia	7	2	0	13	73	49	2	4	—	—
Totals	1,191	800	2,496	1,826	34,619	34,363	36,025	34,117		
Maize. — Thousand centals (1 cental = 100 lbs).										
					TEN MONTHS (November 1-August 31)				TWELVE MONTHS (Nov. 1-Oct. 31)	
<i>Exporting Countries:</i>										
Bulgaria	31	240	0	0	3,318	3,316	0	0	4,017	0
Hungary	0	11	143	53	236	3,313	2,127	77	3,351	132
Rumania	—	—	—	(1)	14,513 (1)	25,183 (1)	0 (1)	—	28,424	2
Yugoslavia	106	606	0	—	6,363	11,248	9	11	12,013	33
United States	88	139	11	15	1,168	3,995	509	249	4,303	708
Argentina	21,008	12,037	—	—	149,661	73,657	—	—	96,331	—
Brazil	—	—	—	(2)	18 (2)	311	—	—	328	—
Java and Madura	—	—	—	(2)	2,105 (2)	1,693	—	—	1,759	—
Indo-China	150	112	—	—	1,863	1,484	—	—	2,339	—
Syria and Lebanon	—	—	—	(2)	150 (2)	335 (2)	49 (2)	18	434	35
Egypt	—	—	—	(2)	4 (2)	18 (2)	101 (2)	18	20	33
Union of South Africa . .	—	—	—	(3)	1,032 (3)	2,298 (3)	0 (3)	0	12,267	0
<i>Importing Countries:</i>										
Germany	0	0	1,217	767	0	0	7,906	14,645	0	16,506
Austria	0	0	805	323	2	15	4,817	3,768	18	4,312
Belgium	40	9	1,958	1,629	701	185	13,523	10,593	220	12,908
Denmark	0	0	2,538	408	0	0	10,646	5,093	0	8,250
Spain	0	0	317	198	0	0	3,067	3,644	0	3,840
Irish Free State	—	—	—	(2)	26 (2)	20 (2)	8,087 (2)	5,340	29	8,047
Finland	—	—	46	13	—	—	218	99	—	187
France	0	2	2,352	1,202	37	44	17,214	12,225	46	17,357
Gr. Brit. and N. Ir. . . .	220	196	5,838	3,532	1,964	1,687	41,291	27,265	2,150	36,306
Greece	—	—	31	9	—	—	351	179	—	185
Italy	0	0	2,524	1,047	7	7	13,671	12,857	7	15,252
Norway	—	—	476	128	—	—	3,109	2,097	—	2,876
Netherlands	20	86	3,300	2,101	251	593	25,439	13,814	626	23,177
Poland	0	0	26	26	0	4	445	353	4	392
Portugal	—	—	150	216	—	—	1,324	1,182	—	1,442
Sweden	—	—	1,027	86	—	—	5,587	1,947	—	2,262
Switzerland	0	0	406	196	2	0	2,560	1,876	0	2,542
Czechoslovakia	0	0	1,662	452	2	2	10,371	4,453	2	5,443
Canada	0	0	450	223	7	4	3,657	0,019	4	7,573
Japan	—	—	99	75	—	—	1,440	1,332	—	1,486
Tunis	0	0	2	0	9	2	269	0	2	0
Totals	21,663	13,498	25,378	12,695	153,439	139,429	177,797	134,154	168,694	169,036

(1) (2) (3) (4) See notes page 642.

COUNTRIES	AUGUST				EIGHT MONTHS (January 1-August 31)				TWELVE MONTHS (January 1-Dec. 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1931	1930	1931	1930	1931	1930	1931	1930	1930	1930
Rice. — Thousand centals (1 cental = 100 lbs).										
<i>Exporting Countries:</i>										
Spain	40	22	0	0	476	725	0	0	1,252	0
Italy	163	271	2	0	2,004	2,802	35	115	4,716	184
United States	110	104	4	9	1,773	1,367	258	205	2,621	293
Brazil	—	—	—	—	1,296 (2)	428	—	—	844	—
India	3,280	2,454	128	(2)	33,550	47,256	428	20	57,818	139
Indo-China	1,045	1,504	—	—	15,271	16,700	—	—	21,998	—
Siam	1,911	1,482	—	—	16,921	15,077	—	—	20,598	—
Egypt	—	—	—	(2)	503 (2)	655 (2)	190 (2)	143	1,206	251
<i>Importing Countries:</i>										
Germany	110	112	1,080	597	849	1,069	5,681	4,028	1,594	5,508
Austria	0	0	51	57	0	0	412	419	0	606
Belgium	15	2	170	90	115	7	931	756	9	1,047
Denmark	0	0	0	13	0	0	97	84	0	139
Estonia	—	—	4	4	—	—	22	24	—	35
Irish Free State	—	—	—	(2)	0 (2)	0 (2)	35 (2)	31	—	0
France	88	84	531	520	626	1,250	3,766	3,503	1,903	5,650
Gr. Brit. and N. Ir.	15	15	154	187	152	170	1,733	1,764	218	2,564
Greece	—	—	44	42	—	—	373	348	—	386
Hungary	0	0	22	15	0	7	826	150	9	388
Latvia	0	0	11	11	0	4	71	31	7	62
Lithuania	0	0	2	2	0	0	18	20	0	31
Norway	—	—	13	0	—	—	93	68	—	101
Netherlands	104	161	353	313	1,761	1,418	4,277	3,232	2,035	3,563
Poland	31	13	170	509	214	84	1,142	1,173	126	1,177
Portugal	—	—	64	51	—	—	412	644	—	941
Sweden	—	—	0	0	—	—	123	161	—	161
Switzerland	0	0	26	25	0	0	260	227	0	408
Czechoslovakia	0	0	117	90	0	0	717	643	0	979
Yugoslavia	0	0	49	42	2	2	309	254	2	516
Canada	0	0	13	13	0	0	538	452	0	584
Chile	—	—	—	—	—	(2)	373 (2)	377	—	518
Ceylon	0	0	935	791	15	7	6,923	7,474	9	10,809
Java and Madura	—	—	—	(2)	123 (2)	42 (2)	3,818 (2)	4,206	117	5,487
Japan	620	4	249	254	3,662	150	1,792	2,758	1,252	3,973
Syria and Lebanon	—	—	—	(2)	0 (2)	2 (2)	181 (2)	157	2	320
Turkey	0	0	20	15	0	2	117	119	2	203
Algeria	—	—	—	(1)	0 (1)	0 (1)	46 (1)	30	9	104
Tunis	0	0	2	2	0	0	22	15	0	24
Union of S. Africa	—	—	—	(3)	0 (3)	0 (3)	589 (3)	492	0	980
Australia	0	4	2	11	95	51	20	60	71	75
New Zealand	—	—	—	(2)	0 (2)	0 (2)	51 (2)	53	0	66
Totals	8,369	6,252	4,234	3,682	81,408	89,435	36,201	34,236	117,918	49,363
Linseed. — Thousand centals (1 cental = 100 lbs).										
<i>Exporting Countries:</i>										
Estonia	0	0	0	2	2	2	0	2	55	2
Lithuania	0	0	0	0	130	55	0	0	443	—
Argentina	3,510	1,532	—	—	32,419	17,981	—	—	25,466	—
India	192	545	0	0	1,651	4,830	0	0	5,763	0
Tunis	0	2	0	0	4	9	0	0	9	0
<i>Importing Countries:</i>										
Germany	0	0	474	417	9	24	5,584	3,766	26	5,194
Belgium	7	2	267	82	71	53	2,599	1,080	63	1,676
Denmark	—	—	51	33	—	—	324	254	—	359
Spain	—	—	18	53	—	—	300	265	—	419
Finland	0	0	2	0	0	0	46	61	0	79
France	0	0	575	573	13	0	3,752	2,787	15	4,288
Gr. Brit. and N. Irel.	0	0	414	340	4	9	5,132	2,851	9	5,031
Greece	0	0	0	2	0	2	57	35	2	64
Hungary	11	53	0	7	22	62	2	104	143	108
Italy	0	0	159	82	0	0	943	672	0	1,175
Latvia	2	2	11	2	55	55	66	62	236	168
Norway	—	—	0	22	—	—	234	247	—	357
Netherlands	2	4	498	580	44	120	6,532	4,158	146	5,617
Poland	0	0	9	11	4	18	265	130	31	150
Sweden	—	—	79	82	—	—	820	606	—	798
Czechoslovakia	0	2	51	57	2	9	370	271	18	446
Yugoslavia	0	0	7	4	0	2	108	95	2	121
Canada	35	0	15	0	483	110	15	452	783	454
United States	—	—	750	309	—	—	5,104	6,636	—	7,093
Japan	—	—	15	22	—	—	141	84	—	126
Australia	0	0	15	40	0	0	249	267	0	840
Totals	3,759	2,142	3,419	2,729	34,913	23,356	32,613	24,897	33,215	34,069

(1) (2) (3) See notes page 642.

COUNTRIES	AUGUST				EIGHT MONTHS (January 1-August 31)				TWELVE MONTHS (January 1-Dec. 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1931	1930	1931	1930	1931	1930	1931	1930	1930	1930
Butter. — (Thousand lbs)										
<i>Exporting Countries:</i>										
Austria	251	432	55	26	1,433	2,247	1,512	514	4,112	545
Denmark	30,428	30,497	150	170	257,353	252,726	1,108	1,120	872,558	1,389
Estonia	4,063	2,824	0	0	21,175	18,909	0	0	31,010	0
Irish Free State					(2) 21,416 (2)	30,744 (2)	3,175 (2)	2,806	58,815	3,391
Finland	2,467	1,991	0	2	28,290	27,507	0	2	37,726	7
France	979	1,089	2,194	227	6,484	7,694	32,979	9,808	12,095	12,924
Hungary	459	262	0	0	1,268	1,874	117	40	3,430	40
Latvia	4,321	5,351	0	2	27,728	27,728	20	20	40,630	49
Lithuania	2,306	2,002	0	0	13,181	10,496	0	0	16,219	0
Netherlands	6,563	9,326	704	154	52,686	65,940	4,223	2,028	92,394	4,396
Poland	3,058	3,419	2	4	19,815	17,910	26	18	26,714	29
Sweden	3,183	4,777	2	0	30,902	40,638	9	15	58,857	18
U. S. S. R.				(3)	18,052 (3)	9,833			23,149	
Argentina	544	2,277			29,134	30,785			51,156	
India	26	29	22	20	225	375	223	179	551	282
Syria and Lebanon				(2)	1,080 (2)	1,270 (2)	185 (2)	42	2,161	172
Australia	9,264	4,480	0	0	111,889	64,880	0	2	120,411	2
New Zealand	9,109	7,405			137,536	138,052			208,170	
<i>Importing Countries:</i>										
Germany	49	20	18,821	26,489	214	468	141,348	180,400	578	293,560
Belgium	281	214	3,142	1,625	1,790	1,748	28,863	13,148	2,648	22,412
Spain	2	13	2	7	66	117	42	146	161	328
Gr. Brit. and N. Irel.	1,440	705	73,690	60,874	24,469	9,103	610,685	525,725	21,023	764,782
Greece			185	139			1,184	904		1,420
Italy	44	82	108	26	1,106	1,484	4,896	1,240	1,744	3,115
Norway	71	0	40	1,288	229	212	871	236	236	1,580
Switzerland	2	2	1,418	2,187	7	31	15,126	12,788	42	16,786
Czechoslovakia	2	2	611	190	304	456	3,241	360	694	714
Canada	1,706	137	2	1,806	6,219	677	2,815	34,954	1,179	38,605
United States	150	212	62	128	1,528	2,290	880	2,097	2,471	2,471
Ceylon			42	55			401	498		723
Java and Madura				29			(2) 5,075 (2)	4,861		7,557
Japan			7		(1) 24 (1)	24 (1)	1,362 (1)	1,288	82	3,232
Algeria				(2)	24 (2)	9 (2)	1,395 (2)	1,504	13	2,417
Egypt				38	4	4	569	527	13	329
Tunis	4	0	49							
Totals	80,830	71,638	101,407	94,497	816,739	766,222	858,871	807,643	1,197,543	1,186,336
Cheese. — (Thousand lbs.)										
<i>Exporting Countries:</i>										
Denmark	844	1,409	53	64	6,151	8,558	410	456	12,626	809
Finland	441	401	0	2	4,101	2,747	15	18	4,683	35
Italy	6,235	3,589	922	1,168	55,233	50,363	6,779	8,195	80,802	12,566
Lithuania	243	168	0	0	1,572	1,241	7	4	1,960	11
Norway	203	97	26	37	1,486	778	357	428	1,380	750
Netherlands	17,011	19,244	119	128	127,860	138,843	829	941	206,789	1,510
Poland	205	430	46	84	1,907	1,936	511	703	3,267	1,074
Switzerland	4,802	4,947	683	220	38,605	44,284	4,195	2,782	66,146	4,251
Czechoslovakia	617	472	685	348	5,229	4,405	2,628	2,075	8,274	2,963
Yugoslavia	498	507	13	26	2,399	2,130	161	203	4,583	300
Canada	11,929	10,188	68	101	31,240	32,241	886	1,133	66,955	1,779
Australia	443	655	2	2	3,000	3,417	20	141	7,273	160
New Zealand	6,080	8,680	0	2	125,435	137,785	4	4	201,256	7
<i>Importing Countries:</i>										
Germany	650	505	9,577	13,832	4,235	3,377	79,753	91,977	5,410	137,459
Austria	549	595	459	434	3,984	2,205	4,288	4,120	4,482	5,637
Belgium	71	75	4,742	5,141	540	571	39,503	33,524	890	51,994
Spain	20	31	260	439	187	150	2,266	3,497	207	5,836
Irish Free State				(2)	57 (2)	71 (2)	1,426 (2)	1,354	194	2,850
France	2,037	2,379	7,110	6,184	21,499	26,257	52,923	39,721	38,963	60,080
Gr. Brit. and N. Irel.	558	745	22,919	32,426	4,806	6,001	212,683	231,572	8,927	348,592
Greece		9	229	163	117	170	2,247	1,799	262	2,302
Hungary	4	7	7	31	82	53	172	276	83	885
Portugal			108	55			456	472		1,010
Sweden			90	93			935	798		1,470
United States	126	148	4,389	3,086	1,241	1,504	38,043	47,375	2,180	63,313
India	0	0	62	99	2	2	540	675	7	1,133
Java and Madura						(2)	882 (2)	895		1,671
Syria and Lebanon				(2)	73	106 (2)	388 (2)	353	132	730
Algeria				(1)	77 (1)	79 (1)	2,828 (1)	3,948	212	10,397
Egypt				(2)	37 (2)	40 (2)	4,251 (2)	3,990	60	7,553
Tunis	0	2	122	117	22	13	1,215	1,093	29	1,746
Totals	53,748	57,339	52,644	64,888	442,047	463,277	454,608	454,225	737,834	746,244

(1) (2) (3) See notes page 642.

COUNTRIES	AUGUST				TWELVE MONTHS (August 1-July 31)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1931	1930	1931	1930	1930-31	1929-30	1930-31	1929-30	1929-30	1929-30
Cotton. — Thousand centals (1 cental = 100 lbs)										
<i>Exporting Countries:</i>										
United States	—	—	—	—	—	—	—	—	—	—
Argentina	1,749	2,904	35	20	36,391	35,920	538	1,880	—	—
Brazil	49	77	—	—	439	597	—	—	—	—
India	—	—	—	—	516	1,351	—	—	—	—
Egypt	1,024	988	79	73	14,645	15,172	1,845	600	—	—
<i>Importing Countries:</i>										
Germany	152	352	425	514	6,069	6,367	0	0	—	—
Austria	—	—	—	—	1,706	1,885	8,442	8,944	—	—
Belgium	0	0	33	37	—	2	467	562	—	—
Denmark	37	15	121	130	201	106	1,713	2,030	—	—
Spain	—	—	7	9	—	—	154	146	—	—
Estonia	2	2	55	126	24	44	2,253	2,207	—	—
Finland	0	0	7	13	0	0	84	180	—	—
France	0	0	20	11	0	2	172	143	—	—
Gr. Brit. and N. Irel	71	55	187	324	549	668	8,142	8,272	—	—
Greece	31	66	622	489	481	789	10,959	13,181	—	—
Hungary	0	0	18	9	0	2	225	68	—	—
Italy	—	—	15	15	—	—	201	291	—	—
Latvia	0	0	214	185	2	9	3,821	5,150	—	—
Norway	0	0	4	11	0	0	62	77	—	—
Netherlands	—	—	2	4	—	—	46	46	—	—
Poland	0	0	75	60	7	7	1,043	1,027	—	—
Portugal	2	2	97	128	24	26	1,444	1,215	—	—
Sweden	—	—	29	13	—	—	338	401	—	—
Switzerland	—	—	49	33	—	—	467	516	—	—
Czechoslovakia	0	0	31	31	7	0	608	639	—	—
Yugoslavia	11	15	143	172	154	170	2,368	2,701	—	—
Canada	0	0	15	18	0	0	185	198	—	—
Japan	—	—	49	35	—	—	1,025	1,043	—	—
Algeria	0	33	725	430	534	417	13,757	13,082	—	—
Totals	2,507	3,409	3,057	2,892	62,360	63,547	60,446	64,560		

Wool. — (Thousand lbs).

COUNTRIES	AUGUST				TWELVE MONTHS (August 1-July 31)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1931	1930	1931	1930	1930-31	1929-30	1930-31	1929-30	1929-30	1929-30
Wool. — (Thousand lbs).										
<i>Exporting Countries:</i>										
Spain	271	816	928	624	3,946	8,002	10,474	5,767	—	—
Irish Free State	—	—	—	—	(2) 6,051 (2)	9,315 (2)	983 (2)	917	—	—
Hungary	644	1,867	40	170	9,931	10,013	1,612	1,550	—	—
Argentina (a)	0,102	8,739	—	—	329,870	277,391	—	—	—	—
Chile (b)	—	430	—	—	6,206	—	—	—	—	—
India	5,997	2,136	470	205	(2) 47,499 (2)	19,044	—	—	—	—
Syria and Lebanon	—	—	—	—	41,806	47,823	4,857	4,189	—	—
Algeria	—	—	—	—	(2) 9,198 (2)	6,995 (2)	2,932 (2)	1,485	—	—
Egypt	—	—	—	—	(1) 10,715 (1)	0,023 (1)	573 (1)	999	—	—
Tunis	24	7	40	159	(2) 3,435 (2)	2,432 (2)	2 (2)	2	—	—
Un. of S. Africa (a)	—	—	—	—	553	800	—	1,113	—	—
Australia (b)	11,078	8,397	11	57	(3) 267,781 (3)	286,434 (3)	33 (3)	0	—	—
New Zealand (a)	2,458	3,029	0	20	(3) 4,422 (3)	6,007 (3)	500 (3)	284	—	—
Yugoslavia (b)	1,301	1,958	0	0	749,742	738,151	2,337	2,837	—	—
Poland	3,875	3,051	0	0	43,923	47,375	53	664	—	—
Switzerland	—	—	—	—	0	172,343	154,567	0	13	—
Sweden	—	—	—	—	44,117	43,989	0	7	—	—
<i>Importing Countries:</i>										
Germany (a)	1,594	514	16,111	27,234	11,805	11,183	329,621	294,117	—	—
Austria (b)	1,387	1,124	2,000	2,242	13,153	14,996	30,552	28,609	—	—
Belgium	18	33	309	1,089	254	366	14,149	15,655	—	—
Denmark (a)	1,106	333	9,575	11,087	10,311	9,006	138,485	166,963	—	—
Finland (b)	1,733	1,612	355	434	21,638	25,946	3,918	4,945	—	—
France	9	11	335	137	93	130	3,591	3,413	—	—
Gr. Britain and N. Ir.	11	2	90	141	84	84	2,328	1,929	—	—
Greece	3,190	3,874	23,383	60,954	51,006	55,934	479,302	545,338	—	—
Italy (a)	16,773	21,793	19,522	39,007	300,823	333,774	821,498	779,872	—	—
Netherlands (b)	77	82	260	373	392	659	3,025	2,714	—	—
Poland	157	364	5,121	7,061	2,161	1,080	96,636	95,006	—	—
Sweden	624	168	1,146	719	4,967	2,665	9,599	13,109	—	—
Switzerland	93	57	84	143	725	968	1,596	1,885	—	—
Czechoslovakia	192	190	320	472	2,394	2,112	8,770	10,532	—	—
Yugoslavia (a)	35	42	787	527	388	527	7,046	6,257	—	—
Canada (b)	207	141	2,154	2,524	2,610	3,338	38,253	84,743	—	—
United States	—	—	1,563	944	—	—	15,461	15,741	—	—
Japan	42	0	939	2,260	866	55	18,922	19,178	—	—
Totals	63,276	62,464	110,215	181,632	2,181,451	2,145,499	2,399,847	2,419,724		

(a) = Wool, greasy; (b) = Wool, scoured.

(2) (3) (4) See notes page 641.

COUNTRIES	AUGUST		TWO MONTHS (July 1-August 31)		TWELVE MONTHS (July 1- June 30)	COUNTRIES	AUGUST		TWO MONTHS (July 1-August 31)		TWELVE MONTHS (July 1- June 30)
	1931	1930	1931	1930	1930-31		1931	1930	1931	1930	1930-31
Coffee. (Thousand lbs)						Tea. (Thousand lbs).					
Exports.						Exports.					
<i>Exporting Countries:</i>						<i>Exporting Countries</i>					
Brazil	13	84	(-) 157,278	(-) 139,174	2,317,280	Ceylon	16,369	18,034	37,139	41,619	247,397
India			123	379	23,488	India	38,768	42,014	68,928	84,966	347,399
Java and Madura			(-) 5,284	(-) 4,103	38,105	Java and Madura			(-) 13,393	(-) 11,435	158,936
						Japan	3,243	3,500	6,052	6,834	24,315
<i>Importing Countries:</i>						<i>Importing Countries:</i>					
Germany	117	35	496	66	1,345	Belgium	2	2	4	4	31
Belgium	445	79	1,160	183	5,090	Irish Free State		(-)	13	(-)	18
France	2	22	4	24	60	France	0	4	4	7	35
Netherlands	518	1,616	1,887	3,183	18,243	Gr. Brit and N Ir	0,352	7,222	13,827	14,083	87,052
Portugal	97	31	112	77	553	Netherlands	13	7	24	13	115
Switzerland	22	35	99	60	399	United States	20	31	44	57	456
Canada	2	4	9	9	55	Syria and Lebanon		(-)	0	(-)	2
United States	2,187	2,127	3,697	3,724	24,321	Algeria				(-)	20
Ceylon	0	130	2	183	227	Union of S. Africa					66
Syria and Lebanon		(-)	2	(-)	4	Australia	90	53	130	132	853
Australia	2	2	9	9	53	New Zealand		(-)	0	(-)	20
Totals	—	—	—	—	2,429,261	Totals	64,857	70,928	139,558	160,090	867,013
Imports.						Imports.					
<i>Importing Countries:</i>						<i>Importing Countries</i>					
Germany	23,417	31,332	48,991	70,628	350,362	Germany	608	958	1,530	2,800	12,741
Austria	551	1,629	2,260	3,252	23,265	Austria	37	71	212	121	1,400
Belgium	13,356	8,620	24,648	16,116	123,457	Belgium	62	49	108	95	689
Bulgaria	82	117	214	231	1,680	Denmark	90	99	190	187	1,296
Denmark	4,184	3,664	10,362	8,020	63,224	Spain	20	20	64	40	282
Spain	3,400	3,596	7,277	8,865	53,363	Estonia	13	11	15	15	146
Estonia	13	20	31	44	309	Irish Free State . . . . .	...	(-)	1,490	(-)	1,660
Irish Free State		(-)	44	(-)	40	Finland	15	18	35	35	200
Finland	2,659	3,448	5,783	6,803	40,442	France	282	218	467	425	3,536
France	39,209	31,266	77,663	63,857	405,861	Gr. Britain and N. Ireland	49,064	57,757	93,243	96,761	541,616
Gr. Britain and N. Ireland	2,767	2,723	6,415	6,281	37,858	Greece	42	44	71	75	644
Greece	1,140	1,019	2,196	2,125	12,959	Hungary	42	42	95	71	650
Hungary	648	586	1,360	1,281	7,563	Italy	13	20	26	31	326
Italy	7,423	7,694	14,872	14,778	98,480	Latvia	9	20	20	31	163
Latvia	35	37	57	66	353	Lithuania	2	13	20	33	179
Lithuania	26	51	57	88	478	Norway	26	29	49	64	388
Norway	2,712	2,756	7,053	5,265	37,690	Netherlands	2,515	2,553	5,172	5,141	32,512
Netherlands	9,087	8,217	17,611	15,258	100,483	Poland	276	326	631	677	4,014
Poland	1,181	1,356	2,833	2,683	17,589	Portugal	49	51	115	101	597
Portugal	620	924	1,724	1,810	11,413	Rumania . . . . .	...	...	...	(-)	838
Rumania				(-)	5,356	Sweden	60	66	112	106	928
Sweden	8,386	7,930	17,549	16,420	100,829	Switzerland	104	104	256	234	1,731
Switzerland	1,836	1,475	5,238	3,501	31,608	Czechoslovakia	139	119	220	196	1,473
Czechoslovakia	2,441	1,206	4,883	4,965	29,026	Yugoslavia	57	51	95	95	628
Yugoslavia	1,559	1,323	3,236	2,930	20,862	Canada	1,704	4,193	2,855	7,465	43,147
Canada	2,242	1,739	4,508	4,511	33,689	United States	7,976	8,185	14,555	15,141	87,151
United States	116,737	93,028	282,003	199,601	1,728,578	Chile . . . . .	...	(-)	877	(-)	703
Chile		(-)	1,519	(-)	593	Syria and Lebanon . . . . .	...	(-)	15	(-)	20
Ceylon	820	392	1,288	595	3,148	Turkey	148	126	208	245	2,138
Japan	461	302	858	661	4,478	Algeria				(-)	2,460
Syria and Lebanon		(-)	163	(-)	154	Egypt		(-)	2,086	(-)	456
Turkey	884	913	1,612	1,949	12,853	Tunis	2,630	251	4,235	511	2,952
Algeria				(-)	25,576	Union of S. Africa					13,208
Egypt			(-)	1,243	(-)	948	Australia	4,211	4,120	7,520	9,083
Tunis	214	201	401	461	3,036	New Zealand		(-)	1,036	(-)	1,224
Un. of S. Africa					31,890						14,405
Australia	335	234	520	567	2,619	<i>Exporting Countries:</i>					
New Zealand			(-)	42	(-)	55	India	833	419	1,378	990
<i>Exporting Countries:</i>						<i>Exporting Countries:</i>					
India	2	1,065	24	1,497	4,090	Java and Madura			(-)	1,041	(-)
Java and Madura											11,830
Totals	248,377	219,763	536,338	467,098	3,456,377	Totals	21,927	79,913	140,132	146,011	881,327

(1) (2) See notes page 642.

COUNTRIES	AUGUST		ELEVEN MONTHS (Oct 1-August 31)		TWELVE MONTHS (Oct 1- Sept 30)	COUNTRIES	AUGUST		TWELVE MONTHS (August 1-July 31)		TWELVE MONTHS (August 1 July 31)
	1931	1930	1930-31	1929-30	1929-30		1931	1930	1930-31	1929-30	1929-1930
Cacao, 'Thousand lbs.						Total Wheat and Flour (*) (Thousand centals).					
EXPORTS						a) NET EXPORTS					
<i>Exporting Countries:</i>						<i>Exporting Countries:</i>					
Grenada			(2) 9,513 (2)	8,607	9,074	Bulgaria	271	428	3,527	(5)	--
Dominican Republ	7,061	8,811	55,768	41,169	42,693	Spain		2	104	(5)	--
Brazil			(2) 111,109 (2)	134,165	162,486	Hungary	780	1,409	10,591	17,494	--
Ecuador			(2) 31,312 (2)	36,290	39,399	Lithuania		2	4	567	--
Trinidad			(2) 57,770 (2)	49,798	54,492	Poland	80	22	2,586	117	--
Venezuela			(2) 39,458 (2)	30,543	38,773	Rumania			9,235	1,662	--
Ceylon	251	531	5,042	7,041	8,446	U. S. S. R.			3(7) 84,560 (3)	74,420	--
Java and Madura			(2) 2,161 (2)	1,722	2,833	Yugoslavia	2,608	1,131	3,862	13,719	--
Cameroon			(2) 20,488 (2)	21,978	24,654	Canada	8,497	12,216	154,489	110,381	--
Ivory Coast			(2) 44,525 (2)	44,494	47,638	United States	6,210	13,585	65,621	83,055	--
Gold Coast	7,214	25,516	473,882	493,709	507,506	Argentina	3,245	2,079	72,553	90,381	--
Nigeria			(2) 109,235 (2)	115,776	116,634	Chile			567	728	--
St. Thomas and Prince	1,782	1,000	24,972	31,165	32,800	British India	2	1,023	(5)	248	--
Togoland			(2) 11,687 (2)	13,845	14,357	Turkey	9	18	282	(5)	--
						Algeria			(1) 5,038 (1)	2,072	--
						Tunis	761	650	3,431	3,468	--
						Australia	4,740	3,448	90,379	36,689	--
						Totals	27,213	36,013	487,942	364,480	--
<i>Importing Countries:</i>						<i>Importing Countries:</i>					
Germany	0	0	432	216	216						
Belgium	51	22	604	245	304						
France	0	0	223	37	37						
Netherlands	388	562	9,716	10,170	10,970						
Poland	0	0	0	13	13						
Czechoslovakia	0	0	18	20	20						
United States	397	507	7,591	7,826	8,955						
Australia	0	26	68	271	276						
Totals	17,154	29,988	1,015,524	1,050,081	1,122,636						
IMPORTS.						b) NET IMPORTS					
<i>Importing Countries:</i>						<i>Importing Countries:</i>					
Germany	8,550	12,383	169,163	155,060	165,548	Germany	1,045	1,942	18,680	28,744	--
Austria	443	611	10,075	9,412	10,170	Austria	397	240	9,345	11,308	--
Belgium	1,029	1,475	24,385	15,596	17,320	Belgium	2,282	2,723	28,024	25,402	--
Denmark	429	249	7,438	5,814	6,195	Bulgaria	(6)	(6)	(6)	855	--
Spain	370	754	22,046	17,375	18,047	Denmark	335	392	6,905	4,650	--
Estonia	62	21	441	331	366	Spain	(6)	(6)	(6)	2,063	--
Irish Free State			(2) 1,636 (2)	743	858	Estonia	44	64	455	705	--
Finland	18	29	207	273	304	Irish Free State			11,270	10,373	--
France	6,360	4,559	83,952	71,474	77,726	Finland	238	271	2,956	3,320	--
Gr. Brit. and N. Ir.	7,685	6,091	121,493	118,741	128,805	France	4,623	972	36,595	6,574	--
Greece	201	179	2,240	2,022	2,187	Gr. Brit. and N. Ir.	13,790	10,201	134,311	122,913	--
Hungary	243	331	4,949	4,414	4,760	Greece	1,069	1,116	14,454	12,998	--
Italy	743	1,058	15,289	13,537	14,908	Italy	437	2,700	48,322	25,402	--
Latvia	139	218	1,596	1,808	2,035	Latvia	44	159	924	1,470	--
Lithuania	57	42	692	498	553	Norway	344	481	4,985	4,048	--
Norway	492	326	4,127	4,667	4,993	Netherlands	1,063	1,761	20,900	18,100	--
Netherlands	4,414	4,658	140,089	113,885	117,981	Portugal	306	71	1,607	3,935	--
Poland	721	791	11,455	10,838	11,903	Sweden	203	309	2,939	4,365	--
Sweden	637	494	8,483	8,098	8,545	Switzerland	(7) 1,034 (7)	935 (7)	11,094 (7)	9,590	--
Switzerland	461	254	23,420	15,838	16,228	Czechoslovakia	1,001	937	10,302	7,023	--
Czechoslovakia	1,283	1,486	17,167	15,845	16,691	Ceylon	55	82	597	575	--
Yugoslavia	163	181	1,435	1,565	1,724	India	(6)	(6)	3,016	(6)	--
Canada	948	677	15,080	16,841	17,622	Indochina	35	51	571	697	--
United States	30,345	40,014	375,091	408,355	431,014	Japan	423	265	10,964	8,356	--
Australia	807	564	6,596	8,856	9,273	Java and Madura			1,367	1,523	--
New Zealand			(2) 1,340 (2)	1,455	1,676	Syria and Lebanon			101	683	--
						Turkey	(6)	(6)	(6)	481	--
						Egypt			5,763	6,310	--
						Union of South Afr.			(3) 1,845 (3)	2,247	--
						New Zealand			437	276	--
Totals	67,224	77,755	1,069,885	1,016,481	1,082,632	Totals	28,971	25,681	389,777	325,946	--

(*) Flour reduced to grain on the basis of the coefficient: 1,000 centals of flour = 5,333.33 centals of grain.

a) Excess of exports over imports. — b) Excess of imports over exports.

(1) Data up to 30th April. — (2) Data up to 31st July. — (3) Data up to 30th June — (4) Data up to 31st March. — (5) See Net Imports. — (6) See Net Exports. — (7) Wheat only.

STOCKS

STOCKS AND AVAILABLE SALEABLE SUPPLIES OF CEREALS AND POTATOES IN FARMERS' HANDS
IN GERMANY, ON SEPTEMBER, 1931.

PRODUCTS	% Stocks total production				% Available saleable quantities: total production			
	Sept., 15 1931	Sept., 15 1930	Sept., 15 1929	Sept., 15 1928	Sept., 15 1931	Sept., 15 1930	Sept., 15 1929	Sept., 15 1928
Winter wheat . . .	76.4	76.8	82.9	89.3	60.6	63.5	67.9	75.2
Spring wheat . . .	59.5	89.1	93.1	95.0	77.8	79.5	81.4	86.9
Winter rye . . .	77.3	85.2	88.7	84.0	37.1	52.7	55.6	54.6
Winter barley . . .	32.8	55.8	72.4	61.0	11.2	8.5	16.4	30.9
Spring barley . . .	91.6	81.3	90.8	80.0	64.2	61.1	68.7	61.7
Oats . . .	94.5	95.3	94.4	94.7	23.2	35.3	43.0	39.5
Potatoes . . .	92.0	93.8	94.0	95.3	37.4	46.3	47.7	50.7

Authority: Preisberichtsstelle beim Deutschen Landwirtschaftsrat

COMMERCIAL CEREALS IN STORE IN CANADA AND THE UNITED STATES

SPECIFICATION	Friday or Saturday nearest to 1st of month					Friday or Saturday nearest to 1st of month				
	October, 1931	Septem., 1931	August, 1931	October, 1930	October, 1929	October, 1931	Septem., 1931	August, 1931	October, 1930	October, 1929
	1,000 centals					1,000 bushels				
WHEAT :										
Canadian in Canada . . .	(2) 68,920	53,831	63,119	84,566	93,049	(2) 114,866	98,051	105,199	140,943	156,582
U. S. in Canada . . .	(2) 19,360	19,418	13,760	3,347	5,278	(2) 32,266	32,364	22,934	5,579	8,789
U. S. in the United States . .	154,044	156,713	139,449	184,266	118,927	256,740	261,189	232,415	223,826	198,211
Canada in the United States . .	5,470	3,977	3,746	10,832	13,052	9,116	6,628	6,243	17,304	21,753
Total . . .	247,794	233,939	220,074	232,591	231,301	412,988	398,322	366,791	387,632	355,335
RYE :										
Canadian in Canada . . .	(2) 6,803	3,846	6,774	6,108	3,563	(2) 12,039	12,181	12,097	10,906	6,362
U. S. in Canada . . .	(2) 690	981	1,004	1,758	1,652	(2) 1,232	1,752	1,792	3,189	2,950
U. S. in the United States . .	5,654	5,267	5,509	9,526	5,472	10,097	9,406	9,337	17,010	9,771
Canada in the United States . .	218	1	1	96	179	390	2	2	172	320
Total . . .	12,455	10,095	13,288	17,488	10,866	24,028	23,241	23,728	31,227	19,403
BARLEY :										
Canadian in Canada . . .	(2) 5,225	4,159	4,872	13,060	9,318	(2) 10,855	8,665	10,151	28,459	19,402
U. S. in Canada . . .	(2) 12	11	22	278	664	(2) 24	24	45	379	1,384
U. S. in the United States . .	3,461	3,404	3,152	7,611	6,030	7,211	7,092	6,567	15,556	12,568
Canada in the United States . .	40	1	37	345	794	84	3	119	725	1,654
Total . . .	8,738	7,575	8,103	21,397	16,501	18,204	15,784	16,832	45,619	37,003
OATS : (1)										
Canadian in Canada . . .	(2) 3,135	3,099	2,959	3,262	5,833	(2) 9,797	9,684	9,248	10,193	18,223
U. S. in Canada . . .	(2) 110	122	70	842	1,602	(2) 343	380	219	2,633	5,005
U. S. in the United States . .	5,562	4,818	2,565	10,529	9,151	17,380	15,032	8,017	32,904	28,597
Canada in the United States . .	13	13	4	18	91	41	41	13	55	283
Total . . .	8,820	8,052	5,598	14,651	16,677	27,561	25,137	17,497	45,785	52,114
MAIZE :										
U. S. in Canada . . .	(2) 290	274	109	532	487	(2) 517	489	195	950	869
others origin in Canada . . .	(2) 304	184	259	540	186	(2) 542	328	463	964	332
U. S. in the United States . .	3,135	5,078	4,682	2,637	2,478	5,598	9,064	8,361	4,710	4,421
Total . . .	3,729	5,534	5,050	3,709	3,119	6,657	9,881	9,019	6,624	5,622

(1) All oats expressed in bushels of 32 lbs. — (2) September, 25 th.

QUANTITIES OF CEREALS ON OCEAN PASSAGE WITH FIRST DESTINATION FOR EUROPE.

SPECIFICATION	Saturday nearest to 1st of month					Saturday nearest to 1st of month				
	October, 1931	Septem., 1931	August, 1931	October, 1930	October, 1929	October, 1931	Septem., 1931	August, 1931	October, 1930	October, 1929
	1,000 centals					1,000 bushels				
Wheat (and flour in terms of wheat)	22,709	23,147	22,738	26,016	25,344	37,848	46,912	37,896	43,380	42,240
Rye	518	667	408	807	442	926	1,191	729	549	789
Barley	3,720	3,544	2,184	4,468	5,776	7,750	7,883	4,350	9,308	12,082
Oats	1,168	1,274	1,402	1,043	374	3,650	3,980	4,380	3,260	1,170
Maize	21,610	23,506	26,626	15,638	16,430	38,606	41,974	47,546	27,926	29,340

Authority: *Broomhall's Corn Trade News*

GRAIN AND FLOUR STOCKS AT THE PORTS OF GREAT BRITAIN AND IRELAND (1).

PRODUCTS	First of the month					First of the month				
	October, 1931	Septem., 1931	August, 1931	October, 1930	October, 1929	October, 1931	Septem., 1931	August, 1931	October, 1930	October, 1929
	1000 centals					1000 bushels				
WHEAT:										
Grain	12,480	7,892	5,640	4,560	6,144	20,800	12,320	9,400	7,800	10,240
Flour as grain . .	768	672	744	864	720	1,280	1,120	1,240	1,440	1,200
TOTAL	13,248	8,564	6,384	5,424	6,864	22,080	13,440	10,640	9,040	11,400
Barley	720	420	640	700	1,380	1,500	875	1,333	1,458	2,875
Oats	886	672	784	608	720	2,800	2,100	4,250	1,900	2,250
Maize	1,680	2,640	1,536	1,906	2,784	3,000	4,714	2,743	3,514	4,971

Authority: *Broomhall's Corn Trade News*.

(1) Imported cereals.

STOCKS OF COTTON ON HAND IN THE UNITED STATES

LOCATION	Last day of the month					Last day of the month				
	Septem., 1931	August, 1931	July, 1931	Septem., 1930	Septem., 1929	Septem., 1931	August, 1931	July, 1931	Septem., 1930	Septem., 1929
	1000 centals					1000 bales (counting round as half bales)				
In consuming establishments	3,710	4,019	4,761	4,703	3,820	875	840	995	967	792
In public storage and at compresses . .	30,131	21,178	21,647	25,572	15,616	6,297	4,426	4,524	5,247	3,225
TOTAL	33,841	25,197	26,408	30,275	19,436	7,172	5,266	5,519	6,214	4,017

STOCKS OF COTTON AT BOMBAY AND AT ALEXANDRIA

PORTS	Thursday nearest to 1st of month					Thursday nearest to 1st of month				
	October, 1931	Sept., 1931	August, 1931	October, 1930	October, 1929	October, 1931	Sept., 1931	August, 1931	October, 1930	October, 1929
	1000 centals					1000 bales (1 bale = 478 lbs.)				
Bombay (1)	2,144	2,180	2,805	2,096	2,868	449	452	587	438	600
Alexandria	4,103	4,029	4,414	3,686	1,543	858	843	923	771	323

Authorities: *East Indian Cotton Ass.* and *Alexandria General Produce Ass.*

(1) Stocks held by exporters, dealers and mills.

STOCKS OF COTTON IN EUROPE

COUNTRIES, PORTS, DESCRIPTIONS	Thursday or Friday nearest to 1st of month					Thursday or Friday nearest to 1st of month				
	October 1931	Septem., 1931	August, 1931	October, 1930	October, 1929	October, 1931	Septem., 1931	August, 1931	October, 1930	October, 1929
	1000 centals					1000 bales (1 bale = 478 lbs.)				
<i>Great Britain:</i>										
American	1,395	1,691	2,033	1,230	1,213	292	354	425	257	254
Argentine, Brazil- ian, etc.	222	226	195	309	260	46	47	41	65	56
Peruvian, etc. . .	282	272	229	403	373	59	57	48	84	78
East Indian, etc.	574	683	745	234	210	120	143	156	49	44
Egyptian, Sudan- ese	1,365	1,334	1,304	1,266	1,079	295	279	278	205	226
Other (1)	233	253	233	271	351	49	53	49	57	73
TOTAL	3,971	4,459	4,739	3,713	3,495	531	633	662	777	731
<i>Bremen:</i>										
American	872	1,316	1,628	908	914	183	276	341	190	191
Other	65	81	67	34	24	13	17	14	7	5
TOTAL	937	1,399	1,695	942	938	196	293	355	197	196
<i>Le Havre:</i>										
American	596	1,039	1,225	583	364	153	217	256	122	76
Other	140	196	167	191	149	29	41	35	40	31
TOTAL	1,036	1,235	1,392	774	513	217	256	291	162	107
<i>Total Continent (2):</i>										
American	1,639	2,687	3,303	1,683	1,426	343	502	601	352	298
Argentine, Brazil- ian, etc.	97	108	105	84	79	20	23	22	18	17
E. Indian, Australia, ian, etc.	171	202	206	246	149	38	42	43	51	31
Egyptian	117	112	77	75	57	25	23	16	16	12
W. Indian, W. African, ian, etc.	40	56	44	114	106	3	12	9	24	22
TOTAL	2,064	2,765	3,735	2,202	1,817	432	602	731	461	380

Authority: *Liverpool Cotton Ass.*

(1) Includes: W. Indian, etc.; E. African, etc.; W. African, and Australian. — (2) Includes Bremen, Havre, and other Continental ports.

IMPORT DUTIES ON CEREALS AND FLOUR

CHANGES

TO BE MADE IN THE DUTIES PUBLISHED ON PAGE 438 OF THE CROP REPORT OF JULY, 1931.

COUNTRY	PRODUCT	Date when enforced	Original data per metric quintal	Data in Amer. cents per bushel or barrel
Austria	Wheat	July 26	gold crs. 6.00	33.08
"	Rye	"	" 6.00	30.88
"	Barley not for fodder (1)	"	" 6.00	26.47
"	Oats	"	" 3.00	8.82
"	Wheat and rye flour	July 15	" 15.50	279.10
Latvia	Barley	July 27	lats 12.00	50.41
"	Oats	"	" 12.00	38.61
Czechoslovakia	Oats	October 2	crs. 54.00	23.19
"	Wheat and rye flour	"	" 123.00	323.91

(1) Fodder barley remains free.

MONTHLY REVIEW OF PRICES (1)

PRODUCTS, MARKETS AND DESCRIPTIONS	Oct. 16, 1931	Oct. 9, 1931	Oct. 2, 1931	Sept. 25, 1931	Average (2)				Commercial Season	
					Sept. 1931	Oct. 1930	Oct. 1929		1930-31	1929-30
WHEAT.										
Budapest (a) T. & a region (75-80 kg. p. hl.; pengo p. 100 kg.)	968	8.97	8.92	9.75	9.29	15.50	23.36		15.34	22.94
Braila: Home grown (79-80 kg. p. hl.; lei p. 100 kg.)		270	270	275	274	346	682		351	612
Winnipeg: No. 1 Manitoba (cents p. 60 lbs.)	59 1/8	56 1/4	53 1/2	55 1/8 (3)	53	73	141		64 1/4	124 1/8
Chicago: No. 2 Hard Winter (4) (cents p. 60 lbs.)	51 1/8	49 3/4	48 1/4	n. 50	n. 50 1/2	79	125		78	114 1/8
Minneapolis: No. 1 Northern (cents p. 60 lbs.)	66	66 1/8	64 3/4	66 1/4	67 1/2	81 3/4	120 3/4		77 7/8	117 1/2
New York: No. 2 Hard Winter (4) (cents p. 60 lbs.)	64	61 1/4	60 1/8	62 1/4	62 1/8	89 1/4	135 1/4 n.		91 1/8	121 1/4
Buenos Aires (a); Barletta (80 kg. p. hectol. — pesos paper per quintal)	7.00	6.70	6.25	6.30	5.95	8.20	10.66		6.83	10.65
Karachi: Karachi white, 2 1/2 % barley, 1 1/2 % dirt (rupees per 656 lbs.)	17-14-0	17-12-0	16-10-0	17-4-0	17-5-0	21-8-6	40-9-0		19-15-2	36-6-9
Berlin: Home grown (Reichsmarks p. quintal)	21.55	21.25	21.45	21.75	21.45	22.71	23.11		26.00	25.33
Hamburg, c. i. f. (Reichsmarks p. quintal):										
No. 3 Manitoba	(5) 9.74 (5)	9.43 (5)	9.60 (6)	10.51 (6)	10.55	13.35	23.58		—	21.30
No. 2 Hard Winter	8.63	8.33	8.58 (7)	8.41	8.52	14.19	20.80 n.		18.00	19.49
Barusso (79 kg. p. hectol)	8.46	8.11	7.82	7.99	8.19 (8)	12.48	19.84		11.21	13.72
Antwerp (Belgian francs p. quintal):										
Home grown		n. q	n. q	n. q	(9) 91 1/4	87 1/2	161		95 1/2	154 1/8
No. 2 Hard Winter, Gulf	(7) 73	(7) 76	(7) 75	(7) 107 1/4	112	179			112 1/2	171
Paris: Home grown, 75-77 kg (francs p. quintal)	163.00	163.50	169.50	164.75	166.30	168.50	145.45		175.00	180.40
London: Home grown (shillings per 504 lbs.)	26/-	25/-	25/-	21/-	(3) 19/6	30/-	41/1		27/1	40/10
London and Liverpool c. i. f., shipping current month (shillings p. 480 lbs.)										
South Russian (on sample)	22/6	20/3	21/6	n. 22/6	(3) 17/3	25/6	n. q.		23/7	n. q
No. 3 Manitoba	23/7 1/2	22/10 1/2	22/-	n. 25/-	(3) 18/11	28/4	49/10		25/4	45/2
No. 2 Hard Winter (3)	22/6	21/10 1/2	21/-	n. 23/-	(3) 15/8	28/4	43/3		26/4	41/5
White Pacific	n. q	n. q.	26/-	n. 26/-	(3) 19/8	28/7	42/7		26/7	42/3
Rosafe (63 1/2 lbs.), afloat	(12) 22/3	(12) 21/6	(12) 20/-	(12) 22/3	(3) 12/16	11 1/2	26/10		41/2	28/5
Choice White Karachi	25/6	25/-	n. q.	n. 25/6	(3) n. q	28/7	n. 43/-		27/-	42/2
Australian	(13) 25/3	(14) 24/3	(14) 23/9	(14) n. 25/-	(3) 14/19	29/2	44/3		25/7	43/6
Milan (b): Home grown, soft (liras p. quintal)	94.00	93.00	93.00	94.00	94.25	118.10	129.25		109.10	131.30
Genoa c. i. f. (shillings p. metric ton) — La Plata	n. q.	n. q.	n. q.	n. q	n. q	121/-	194/-		110/-	184/6
RYE.										
Budapest (a) Home grown (pengo p. 100 kg.)	9.45	8.95	8.77	9.20	8.92	8.15	15.82		10.79	13.44
Berlin: Home grown (Reichsmarks per quintal)	18.50	18.50	18.80	19.00	18.14	14.77	17.87		17.23	17.04
Hamburg c. i. f.: La Plata, 74-75 kg. (R. M. p. 100 kg)	n. q.	n. q.	n. q.	n. q.	n. q.	n. q	16.45 n.		7.65	14.57
Minneapolis: No. 2 (cents per 56 lbs.)	40 1/2	40 1/2	40	41	39 3/4	49 3/8	96 3/4		42 1/8	80 1/8
Groningen (c): Home grown (florins per quintal)	4.30	4.30	4.50	4.55	4.60	4.52	7.85		4.45	6.33
BARLEY.										
Braila: Home grown (62-63 kg. p. hl.; lei p. 100 kg.)	(15) 190	(15) 186	(15) 186		189	182	(16) 404		232	304
Winnipeg: No. 4 Western (cents p. 48 lbs.)	30	28 1/2	28	29 1/8 (3)	29 1/8	25 1/8	64 1/4		26 1/8	51 7/8
Chicago: Feeding (cents per 48 lbs.)	48	51	53	52	44	48 1/4	60 1/4		43 1/4	57 1/8
Berlin: Home grown fodder (Reichsmarks per quintal)	15.45	15.45	15.25	15.25	15.44	17.26	17.95		18.52	17.40
Antwerp: Danube (francs per quintal)		61	82	65	(17) 69 3/4	65	131 1/2		73 1/4	107 1/2
London: English malting (shillings p. 448 pounds)	41/-	41/-	41/-	41/-	(3) 40/-	40/-	46/8		35/8	39/-
London and Liverpool, c. i. f., parcels (shillings per 400 lbs.):										
Danubian 3 %	n. q.	n. q.	n. q	n. q.	(3) 13/3	13/2	27/4		15/2	22/3
Russian (Azoff-Black sea)	17/-	15/6	15/3	17/-	(3) 13/3	13/2	n. q.		14/3	18/11
Canadian Western, No. 3 (18)	18/1 1/2	17/9	17/9	n. q.	(3) 15/4	16/1	n. 29/4		15/11	27/-
Californian malting (shillings p. 448 lbs.)	85/-	34/6	34/6	36/-	(3) 30/-	26/5	37/4		27/8	32/6
Groningen (c): Home grown winter (fl. p. quintal)	5.12	5.00	5.00	5.00	5.02	4.64	9.10		4.97	7.55

(a) Thursday prices. — (b) Saturday prices. — (c) Prices of preceding Tuesday.

(1) All quotations are, unless otherwise stated, for spots. — (2) The monthly averages are based on Friday quotations, the annual averages on the monthly. — (3) Average for the first 3 weeks. — (4) Quoted formerly as No. 2 Winter. — (5) No. 2 Manitoba. — (6) No. 1 Manitoba. — (7) No. 1 Hard Winter. — (8) 75 kg. p. hl. — (9) Sept. 18: 92. — (10) Sept. 18: 76. — (11) Hard Winter on sample. — (12) 63 lbs. per bushel. — (13) West Australian. — (14) South Australian. — (15) 59-60 kg. p. hl. — (16) 64 kg. p. hl. — (17) Sept. 18: 67. — (18) In lieu of Western No. 4.

PRODUCTS, MARKETS AND DESCRIPTION	Oct	Oct	Oct.	Sept.	Average (1)					
	16,	9,	2,	25,	Sept.	Oct.	Oct	Commercial		
	1931	1931	1931	1931	1931	1930	1929	Season		
									1930-31	1929-30
OATS.										
Braila Home grown (43-44 kg. p. hl ; lei p. 100 kg.)		240	230	230	229	169	314	247	256	
Winnipeg : No. 2 White (cents per 34 lbs.) . . .	31 1/4	29 1/4	28 1/8	27 7/8	(2) 27 1/2	32 3/4	67 7/8	30	58 1/2	
Chicago : No. 2 White (cents per 32 lbs) . . .	23 1/4	23 3/4	24	23 1/8	23 7/8	36 5/8	48	32 1/8	44 5/8	
Buenos Aires (a) : Current quality (pesos paper per quintal)	6 60	5 90	5 45	5 55	4 77	3 66	6 60	3 58	5 30	
Berlin : Home grown (Reichsmarks per quintal) .	14 40	14 30	13 90	14 05	13 81	14 00	17 29	16 17	15 62	
Paris : Home grown, black and other (francs per quintal)	88.75	89.75	84.50	86 50	85.75	78 20	96.50	81.00	81.15	
London : Home grown white (shillings per 336 lbs.)	20/-	19/6	20/6	18/-	(2) 15/8	18/-	23/-	18/4	21/-	
London and Liverpool c. i. f., parcels (shillings p. 320 lbs.) :										
Danubian (39-40 lbs.)	n. q.	n. q.	n. q.	n. q.	n. q.	11/8	n. q.	n. 12/1	(3)n. 16/4	
Plate (f. a. q.)	16/3	14/6	13/9	n. 15/8	(2) 11/3	10/10	20/4	10/9	16/1	
Chilian Tawny	n. q.	n. q.	n. q.	n. q.	(2) 12/8	13/1	20/7	12/-	17/3	
Milan (b) : spot (liras per quintal) :										
Home grown	71.00	71.00	71 00	60.00	60 00	77.70	85 10	73.95	80.75	
Foreign imported	64.50	62.50	63.00	63 00	63.50	60.40	80.10	60 40	74.30	
MAIZE.										
									1929-30	1928-29
Braila : Danube (lei per quintal) . . . . .	..	4) 145	4) 130	157	172	225	405	309	687
Chicago : No. 2 Mixed American (cents per 56 lbs.)	38	38 1/8	38 1/2	40 1/2	43 7/8	38 1/2	96 1/8	85 7/8	94 1/4	
Buenos Aires (a) : Yellow Plate (pesos paper per quintal)	4 02	3 80	3 60	3 62	3 53	4 89	7 96	6 17	8 35	
Antwerp, spot (Belgian francs per quintal) :										
Bessarabian . . . . .	..	58	61	63	(5) 65 1/4	84	n. q.	n. 97 1/4	n. q.
Cinquantino . . . . .	..	49	52	53	(6) 55 3/4	100 1/2	151 1/4	131 1/4	173
Yellow Plate . . . . .	..	46 1/2	48	40	(7) 52	84	124 1/2	109 1/4	155 1/4
London and Liverpool, parcels, c. i. f. (shillings per 480 lbs.) :										
Danube	(8) 16/9	n. q.	n. q.	n. q.	(2) 13/7	19/8	34 9	24/11	n. q.	
Yellow Plate	15/6	14/3	13/9	14/9	(2) 12/7	19/-	32/8	25/3	38/3	
No 2 White African	20/3	19/3	18/6	18/6	(2) 18/1	19/3	35/4	26/-	38/8	
Milan (b) : Home grown (liras per quintal) . . .	56.50	55.50	55.00	58.00	59.50	55.40	83.85	71 35	97.90	
RICE (CLEANED).										
									1930	1929
Milan (b) : Maratelli (lire per quintal)	137 50	119.50	110 00	130 00	108.75	125 80	191.00	152.15	195.70	
Rangoon. No. 2 Burma (rupees per 7500 lbs) .	285	275	275	275	277 1/2	350	504	393 1/4	462 1/4	
Saigon (Indochinese piastres p. quintal) :										
No. 1 Round white (25 % broken)	6 84	6 01	6 43	7 33	7 50	10 18	13 53	11.36	11.58	
No. 2 Japan (40 % broken)	6 34	5 60	6 10	6 84	7 07	9 59	12 89	10.89	11.08	
London (a) : c. i. f. (shillings per 112 lbs) :										
Spanish Belloch, No. 3 oiled	13/-	13/3	13/-	13/-	(2) 10/8	12/7	16/10	14/1	17/11	
Italian good, No. 6 oiled	n. q.	n. q.	n. q.	n. q.	n. q.	13/1	18/1	14/11	18/9	
American Blue Rose	18/6	20/-	n. q.	n. q.	(2) 17/1	19/8	21/10	21/9	21/10	
Burma, No. 2	8/7 1/2	8/5	8/7 1/2	8/1 1/2	(2) 8/3	10/1	14/2	10/11	13/2	
Saigon, No. 1	9/1 1/2	8/4 1/2	9/-	n. q.	(2) 8/2	10/3	14/5	11/6	13/8	
Siam, Garden, No. 1	n. q.	n. q.	n. q.	9/6	(2) 9/1	n. q.	n. q.	14/-	15/1	
Tokio : Various qualities (yens per koku)	17.30	18.00	17.80	17.80	19 27	18 90	31.42	25.57	29.06	
LINSEED.										
Buenos Aires (a) : Current quality (pesos paper per quintal)	11.00	11.00	10.90	11.05	10.67	14.34	23.30	17.19	18.20	
Antwerp : Plate (Belgian francs p. quintal) . .	..	112	136	140	(6) 136	222	393	284 1/4	318 1/4
Hull, c. i. f. : Plate (p. sterling p. l. ton)	8-15-0	8-11-3	8-8-9	9-3-9	(2) 7-11-3	12-3-0	22-15-0	15-0-5	18-5-0	
London, c. i. f. : Bombay bold (p. st. per long ton).	n. 11-10-0	n. 11-0-0	10-12-6	12-10-0	(2) 9-15-8	15-3-6	24-5-0	17-14-4	20-16-1	
Duluth : No. 1, Northern (cents p. 56 lbs.) . . .	124 1/2	123 1/2	124 1/4	133 1/4	134 1/8	177 1/4	331	286	278 1/8	

(a) Thursday prices. — (b) Saturday prices.

(1) The monthly averages are based on Friday quotations, the annual averages on the monthly — (2) Average for the first 3 weeks. — (3) Weight not indicated. — (4) New harvest. — (5) September 18: 64. — (6) September 18: 54 1/2. — (7) September 18: 52. — (8) Dan., Galatz-Foxonian; shipping October-November. — (9) September 18: 133

PRODUCTS, MARKETS AND DESCRIPTION	Average (t)							
	Oct. 16, 1931	Oct. 9, 1931	Oct. 2, 1931	Sept. 25, 1931	Sept. 1931	Oct. 1930	Oct 1929	Commercial Season
								1929-30 1928-29
COTTONSEED								
Alexandria. Sakellaridis (piastres per ardeb)	58 0	55.5	(2) 54.0	(2) 58 0	(2) 48 3	53.8	98 8	67.9 95 4
Hull: Sakellaridis (p. sterl. per long ton)	6-3-9	6-1-3 3/4	5-18-9	n. 6-15-0	4-14-19-2	5-8-0	9-11-3	6-18-2 9-12-2
COTTON.								
								1930-31 1929-30
New Orleans: Middling (cents per lb)	6 08	5.50	5.42	5.93	6.22	10.45	18.09	10.07 16.17
New York: Middling (cents per lb)	6 25	5.80	5.70	6.30	6.54	10.65	18.46	10.38 16.60
Bombay: M. g. Broach f. g. (rupees per 784 lbs.) .	171	165	157	167	152 1/2	199 1/2	338 1/4	191 1/4 283 1/2
Alexandria (a) (talans per kantar):								
Sakellaridis f. g. f.	12.87	12.37	12.37	13.62	11 14	17 1/8	30 1/8	17.12 28 3/8
Ashmouni (Upper Egypt) f. g. f.	9.05	8.65	8.65	9.70	8.37	11 1/8	20 1/4	12.00 19 1/8
Bremen: Middling (U. S. cents per lb)	7 08	6.98	6.75	7.31	7.50	11.78	20.27	11.59 18.27
M. g. Broach fully good (pence per lb.)	n. 3 85 n.	3.75 n.	3 65 n.	4.10 n.	3.52 n.	4 15 n.	8.15 n.	4.63 n. 6.83
Le Havre: Middling, Gulf (francs per 50 kilogr.) .	188	184	183	216	224	355	614	349 545
Liverpool (pence per lb.):								
Middling fair	n. 5 87 n.	5.66 n.	5 41 n.	6.34 n.	4.92 n.	7.03 n.	11.36 n.	6.93 n. 10.39
Middling	4.77	4.50	4.31	5.19 4/	3.72	5.80	10.11	5.72 9.09
São Paulo, good fair	4 87	4 66	4 41	5.34 4/	3.90	6.10	9.03	5.91 9.02
M. g. Broach, fully good	n. 4 16 n.	3.94 n.	3.74 n.	4 19 4/	n. 3 00 n.	4.22 n.	8.17 n.	4 25 n. 6.80
Sakellaridis, fully good fair	7.85	7.10	6.60	7.88 4/	5.73	9 67	15 86	9.08 14 52
BUTTER.								
								1930 1929
Copenhagen (a) (Kr. p. 100 kg)	206	204	218	215	208	246	335	245 303
Maastricht, auction (b): Dutch (florins p. kg.) .	1.17	1.24	1.23	1.23	1.31	1.67	2.33	1.70 2.09
Hamburg, auction (b): Schleswig-Holstein butter with quality mark (R. M. per 50 kg.)	133.43	129.85	133.13	135.39	132.48	148.30	200.14	146.67 178.03
Kempten (b): Allgäu butter (Pfennige p. half kg)	97	97	102	105	105	120	168	128 150
London (c) (shillings p. cwt.):								
British blended	144/4	144/4	140/-	140/-	4) 140/-	147/4	196/-	158/8 196/-
Danish	136/-	140/-	139/-	135/-	4) 130/-	152/10	204/-	153/6 186/6
Irish creamery, salted	125/-	128/-	124/-	122/-	4) 120/4	126/-	189/-	134/10 179/4
Dutch	136/-	140/-	n. q.	126/-	4) 123/8	145/7	205/6	151/11 182/4
Argentine	121/-	121/-	121/-	118/-	4) 117/-	126/10	179/6	135/10 174/1
Siberian	n. q.	n. q.	n. q.	n. q.	n. q.	121/2	174/-	n. 133/10 187/2
Australian, salted	121/-	122/-	120/-	116/-	4) 115/-	124/10	182/-	135/9 176/-
New Zealand, salted	128/-	129/-	127/-	120/-	4) 117/4	126/5	188/-	137/8 178/3
CHEESE.								
Milan (lire per quintal):								
Parmigiano-Reggiano, 1st quality of last year's production	975	975	975	975	1,100	1,100	1,135	1,160 1,074
Green Gorgonzola, mature, choice	615	620	620	620	615	706	811	671 829
Rome: Roman pecorino, choice (lire p. quintal) .	1,152	1,152	1,100	1,075	1,075	1,160	1,410	1,207 1,546
Alkmaar: Edam 40 + 40% butterfat, with the country's cheescemark, factory cheese, small: florins, p. 50 kg.)	27.50	30.00	34.00	35.00	34.75	40.20	52.00	40.83 47.10
Gouda (5): Gouda 45 + (whole milk cheese, with the country's cheescemark, home made; florins, p. 50 kg.)	37.00	38.00	39.00	40.50	40.50	46.90	57.80	45.56 52.45
Kempten (b): (Pfennige per half kg.):								
Softcheese, green (20% butterfat)	25	25	25	25	27 1/2	31	40 1/2	27 35
Emmenthal from the Allgäu (whole milk cheese) 1st quality	98 1/2	98 1/2	98 1/2	98 1/2	99	(6) 91	(6) 102	(6) 97 (6) 107
London (c) (shillings per cwt.):								
English Cheddar	(7) 88/-	(7) 90/-	100/-	92/-	4) 94/8	95/2	107/6	108/4 121/3
Canadian	73/-	73/-	70/-	65/-	4) 84/-	81/8	101/3	93/11 107/8
New Zealand	72/6	72/6	71/6	68/-	4) 64/10	76/7	98/3	82/2 95/5
Liverpool (c): Engl. Cheshire, ungraded (sh. p. cwt.)	95/8	91/-	81/8	77/-	4) 72/4	87/8	100/1	90/5 111/9

(a) Thursday prices. — (b) Wednesday prices. — (c) Average prices for weeks ending on preceding Wednesday.

(1) The monthly averages are based on Friday quotations, the annual averages on the monthly. — (2) November delivery. — (3) November-January delivery. — (4) Average price for the first 3 weeks. — (5) Indicated formerly as: Bode-graven. — (6) Average price for all qualities. — (7) New.

QUARTERLY REVIEW OF PRICES (1)

Groups	COUNTRIES AND PRODUCTS	Average						Agricultural year (2)	
		IX	VIII	VII	IV-VI	VII-IX	VII-IX	1930-31	1929-30
		1931	1931	1931	1931	1930	1929		
GERMANY (Prices in Reichsmarks per quintal).									
A I	Wheat (Berlin)	21.45	21.07	24.06	23.17	25.95	23.82	26.39	25.00
	Rye (Berlin)	18.14	16.34	18.21	19.78	17.07	19.21	17.15	17.27
	Barley, feeding (Berlin)	15.44	15.47	15.75	22.21	18.59	19.80	19.04	17.43
	Oats (Berlin)	13.81	14.62	15.89	18.27	17.54	17.31	16.25	15.77
	Potatoes (Berlin)	2.83	3.24	(3) 0.26	4.61	2.95	4.88	3.29	4.26
A II	Milk, fresh (Berlin)	15.95	17.32	16.00	17.23	17.41	19.83	17.62	16.89
	Butter (Hamburg)	264.96	265.00	252.98	251.22	294.24	354.90	232.10	330.68
	Cheese, Emmentaler variety (Kempten)	198	201	201	188	192	215	192	205
	Beef (Berlin) (4)	77.60	95.60	96.00	93.78	113.53	116.70	106.32	114.84
	Veal (Berlin) (4)	99.40	101.00	90.60	110.23	141.00	143.30	126.23	143.02
	Pork (Berlin) (4)	111.00	112.20	94.20	89.67	126.10	171.80	110.44	154.09
B I	Basic slag (Aachen) (5)	0.25	0.25	0.25	0.233	0.31	0.32	0.30	0.31
	Superphosphate of lime 18 %	6.57	6.57	6.39	6.51	6.44	6.35	6.51	6.51
	Potash salts 18-22 % (5)	0.152	0.152	0.152	0.147	0.152	0.152	0.147	0.152
	Sulphate of Ammonia (5)	0.70	0.63	0.66	0.856	0.78	0.81	0.83	0.86
	Nitrate of lime (5)	0.95	n. q.	n. q.	1.07	0.96	1.03	1.03	1.05
B II	Wheat bran (Hamburg)	9.63	9.84	12.24	13.41	7.74	11.50	9.97	9.33
	Linseed cake (Hamburg)	13.50	13.24	13.60	13.65	16.85	24.00	15.39	21.08
	Coconut cake (Hamburg)	11.64	11.88	12.12	13.18	14.05	19.32	13.32	16.94
	Rapeseed cake (Hamburg)	n. q.	n. q.	n. q.	n. q.	10.01	18.16	9.35	15.59
	Groundnut cake (Hamburg)	11.54	11.33	11.62	12.25	13.49	21.42	12.50	17.55
	Crushed soya extraction residue (Hamburg)	11.60	11.70	12.56	12.73	14.17	19.92	13.44	16.59
DENMARK (Prices in Danish crowns per quintal).									
A I	Wheat (Copenhagen)	n. q.	n. q.	n. 12.12	11.41	14.00	17.33	12.41	16.08
	Rye (Copenhagen)	n. 9.37	n. q.	n. q.	n. q.	n. 8.75	13.50	n. q.	12.80
	Barley (Copenhagen)	n. 9.75	n. 11.50	n. 11.70	11.50	11.70	16.07	11.18	14.13
	Oats (Copenhagen)	n. 12.00	12.34	13.25	13.30	11.80	14.87	11.86	18.69
A II	Butter (Copenhagen)	210	201	190	195	246	303	225	280
	Eggs	111	95	86	74	119	147	121	149
	Pork (4)	81	92	79	89	122	168	98	155
B I	Superphosphate 18 %	5.25	5.25	5.60	5.95	5.79	5.96	5.85	6.22
	Potash salts 40 %	11.45	11.45	12.95	12.95	12.46	12.62	12.62	13.05
	Sulphate of ammonia	8.55	9.40	n. 17.65	17.65	18.12	17.67	17.43	18.55
	Nitrate of lime, Norwegian	12.85	13.00	16.85	16.85	16.27	15.50	16.35	16.47
B II	Maize, Plate (Copenhagen)	n. q.	n. q.	7.07	n. 7.75	12.00	16.80	8.30	13.47
	Wheat bran (Copenhagen)	7.30	7.17	8.60	9.87	8.93	12.87	9.12	11.49
	Cotton seed cake (Copenhagen)	10.10	11.15	12.30	13.12	15.75	20.52	14.37	18.96
	Sunflower seed cake (Copenhagen)	10.53	11.17	11.78	11.45	13.30	19.03	12.55	15.95
	Groundnut cake (Copenhagen)	11.40	11.50	11.83	12.27	13.40	20.32	12.58	17.27
	Crushed soya extraction residue (Copenhagen)	11.23	11.30	11.86	12.71	13.56	18.67	13.08	16.00

(1) Each quarter a list will be published for several countries containing prices of plant (A I) and animal (A II) products sold by the farmer, as well as of fertilisers (B I), and of concentrated feeding stuffs for livestock (B II) bought by the farmer. In the case where the market is not indicated, the price is the average one for the country. — The prices paid to farmers for sugar-beet are generally fixed once a year and therefore are not inserted in these tables.

(2) July to June. — (3) Live weight. — (4) Early variety. — (5) Prices per unit per quintal.

Groups	COUNTRIES AND PRODUCTS	Average						Agricultural year	
		IX	VIII	VII	IV-VI	VII-IX	VII-IX	1930-31	1929-30
		1931	1931	1931	1931	1930	1929		

FRANCE (Prices in francs per quintal).

A I	Wheat (Paris)	166.30	162.45	168.80	186.55	166.30	151.70	173.90	139.70
	Rye (Paris)	n. q.	n. q.	n. q.	n. q.	n. q.	n. 109.00	n. q.	n. 87.70
	Barley (Paris)	n. q.	n. q.	n. q.	88.90	n. q.	n. 115.00	n. 87.00	92.60
	Oats (Paris)	85.75	83.45	85.20	89.60	77.45	105.00	79.80	90.20
	Wine, red (southern markets) (1)		153	175	153	140	106	154	89
A II	Beef (Paris) (2)	885	956	953	961	1,123	887	1,050	916
	Pork (Paris) (3)	647	668	625	579	742	870	665	851
	Mutton (Paris) (2)	1,230	1,290	1,418	1,497	1,476	1,410	1,504	1,452
B I	Basic slag 18 % (Lorraine)	23.40	23.40	23.40	23.40	25.20	26.10	24.30	25.95
	Superphosphate 14 % (North and East)	28.40	28.40	30.40	30.40	31.45	31.50	31.15	31.60
	Sylvinite, minimum 12 %	10.60	10.60	10.60	10.60	10.60	10.95	10.60	10.90
	Nitrate of soda (Dunkirk)	103.00	102.00	101.00	112.65	108.75	110.65	109.40	115.70
	Sulphate of ammonia 20.4 %	101.50	104.75	103.50	115.50	111.05	115.60	112.20	118.85
B II	Linseed cake (North)	83	87	90	86	112	149	103	129
	Coconut cake (Marseilles)	72	72	75	78	75	118	78	102
	Groundnut cake (Marseilles)	85	80	75	78	97	186	85	116

GREAT BRITAIN (A: Prices in shillings and pence per cwt;

B: Prices in pounds sterling, etc. per long ton).

A I	Wheat	4/8	6/8	6/6	5/11	8/-	11/-	6/6	9/8
	Barley	n. q.	5/9	5/9	5/9	6/3	9/2	5/10	7/8
	Oats	5/9	7/-	7/-	6/10	6/3	9/2	6/4	7/6
	Potatoes (London)	6/7	6/7	n. q.	8/9	5/3	4/10	7/-	4/-
A II	Butter (London)	140/-	140/-	140/-	141/10	154/-	186/8	144/9	177/4
	Cheese, Cheddar (London)	94/8	96/9	102/-	105/4	93/4	104/7	98/4	109/1
	Beef (London) (2)	72/4	79/4	86/4	79/9	85/7	81/3	79/2	82/10
	Mutton (London) (2)	98/4	98/-	107/4	110/1	115/1	108/6	107/10	109/8
	Pork (London) (2)	81/5	74/8	71/2	87/-	107/9	108/6	102/10	120/2
B I	Basic slag 14 % (London)	2-1-0	2-1-0	2-1-0	2-2-6	2-3-0	2-3-5	2-2-3	2-3-1
	Superphosphate, 16 % (London)	2-15-0	3-1-0	3-1-0	3-1-0	3-6-0	3-6-0	3-3-6	3-6-0
	Kainit 14 % (London)	2-16-0	2-17-9	3-3-0	3-3-0	2-18-10	2-17-8	3-1-6	3-1-2
	Nitrate of soda, 15 1/2 % (London)	7-13-0	n. q.	10-0-0	10-0-0	9-12-0	9-16-6	9-16-8	10-0-2
	Sulphate of ammonia 20.6 % (London)	5-10-0	6-2-6	9-10-0	9-10-0	9-10-2	9-16-6	9-7-2	9-13-6
B II	Bran, British (London)	4-15-3	4-15-6	4-13-0	4-18-5	4-9-6	6-11-6	4-16-4	5-13-10
	Bran, middlings, imported (London)	4-11-9	4-11-3	4-13-6	4-10-7	4-16-3	6-11-6	4-11-5	5-12-1
	Linseed cake, English (London)	8-3-6	8-6-0	8-7-0	8-12-0	10-11-2	12-13-5	7-9-12	6-12-5
	Cottonseed cake (London)	4-10-0	4-11-0	4-15-3	5-3-9	4-18-3	7-11-5	4-17-8	6-11-7
	Coconut cake (London)	n. q.	n. q.	n. q.	n. q.	n. q.	10-10-1	n. q.	10-8-8
	Palm kernel cake (Liverpool)	(4) 6-0-0	(4) 6-0-0	(4) 6-0-0	(4) 6-1-0	5-10-1	9-13-7	5-9-2	8-8-4

ITALY (Prices in lire per quintal).

A I	Wheat, soft (Milan)	94.25	88.60	90.90	106.40	125.10	123.70	111.00	131.45
	Wheat, hard (Palermo)	125	125	133	141	137	134	135	141
	Oats (Milan)	69.00	66.50	66.75	72.15	75.60	85.70	74.30	82.20
	Maize (Milan)	59.50	49.50	49.30	62.50	70.85	87.40	58.30	77.85
	Rice (Milan)	103.75	96.10	103.40	120.80	152.10	202.90	125.55	181.20
	Hemp, fibre . . . . .	...	218	213	212	330	454	248	401
	Olive oil (Milan)	610	597	591	601	568	663	601	573
	Wine, ordinary. 11° to 13° (Bari) (1)	96	96	96	108	130	144	118	186

(1) Price per hectolitre. — (2) Dead weight. — (3) Live weight. — (4) Hull.

		Average						Agricultural year	
Groups	COUNTRIES AND PRODUCTS	IX	VIII	VII	IV-VI	VII-IX	VII-IX	1930-31	1929-30
		1931	1931	1931	1931	1930	1929		
ITALY (continued)									
A II	Cheese Reggiano (Milan)	1,100	1,225	1,185	1,121	1,227	1,065	1,139	1,125
	Eggs, fresh (Milan) (1)	5 36	4 55	4 37	4 00	5 32	6 38	5 64	6 26
	Beef (Milan) (2)	330	333	352	334	447	498	404	450
	Pork (Milan) (2)	352	356	342	371	515	686	444	637
B I	Basic slag 16-20 % (Chiasso) (3)	1 09	1 11	1 11	1 15	1 37	1 42	1 24	1 43
	Superphosphate, mineral, 15-17 % (Genoa) (3)	1 17	1 17	1 17	1 17	1 30	1 30	1 24	1 30
	Chloride of potassium (Genoa)	71 50	78 00	78 00	73 00	81 40	82 35	80 25	59 50
	Sulphate of ammonia (Genoa)	72 75	70 50	71 00	73 85	87 70	90 60	81 75	91 25
	Copper sulphate (Genoa)	142	n. q.	166	168	201	214	182	223
B II	Wheat bran (Genoa)	59	52	37	39	54	63	45	58
	Rice bran (Milan)	40	37	37	37	38	63	36	57
	Linseed cake (Milan)	63	61	56	57	77	103	65	99
	Groundnut cake (Milan)	56	53	48	50	64	91	55	82
	Rapeseed cake (Milan)	32	33	33	36	40	60	37	66
NETHERLANDS (Prices in guilders per quintal).									
A I	Wheat (Groningen)	n. q.	n. q.	n. q.	6 34	9 11	11 30	6 94	9 09
	Rye (Groningen)	4 60	4 34	4 23	4 43	5 02	8 77	4 49	4 72
	Barley (Groningen)	5 02	5 25	5 48	5 22	5 48	9 38	5 00	7 03
	Oats (Groningen)	5 32	5 50	5 52	5 52	5 79	7 78	5 00	6 16
	Peas (Rotterdam)	10 20	9 75	n. q.	n. 8 25	11 00	15 31	9 40	12 02
	Flax, fibre (Rotterdam)	50	32	33	36	n 80	111	61	100
	Potatoes (Amsterdam) (4)	3 55	4 20	(5) 4 75	n 6 10	4 38	3 36	n. 5 40	2 64
A II	Butter (Maastricht)	131	133	134	136	169	205	157	194
	Cheese, Gouda 45 % (Bodegraven)	81 00	80 24	82 80	71 47	92 02	105 08	89 00	100 54
	Cheese, Edam 40 % (Alkmaar)	69 50	75 50	75 40	66 71	82 59	94 38	74 44	90 99
	Eggs (Roermond) (6) . . . . .	..	..	..	4 18	5 67	7 31	5 25	7 22
	Beef (Rotterdam) (7)	86	92	93	96	108	104	100	105
	Pork (Rotterdam) (2)	44	48	44	39	94	90	49	79
B I	Basic slag (3)	0 107	0 114	0 119	0 124	0 140	0 172	0 144	0 162
	Superphosphate 17 %	2 33	2 47	2 50	2 50	2 84	3 19	2 68	3 15
	Kaunite (3)	0 136	0 132	0 139	0 144	0 151	0 151	0 150	0 150
	Nitrate of soda	n. 8 15	n. q.	n. q.	10 70	10 22	10 23	10 48	10 59
	Sulphate of ammonia 20 ½ %	4 57	4 70	n. q.	9 83	n. 9 53	10 14	9 62	10 06
B II	Maize	3 50	3 72	4 21	4 91	7 16	10 23	5 43	8 54
	Linseed cake, Dutch	7 08	7 46	7 80	7 80	9 95	14 10	9 05	12 24
	Coconut cake	7 44	7 90	8 20	7 98	8 75	11 34	7 88	10 05
	Groundnut cake	7 03	6 80	7 07	7 32	8 85	12 97	7 43	10 95
POLAND (Prices in zlotys per quintal).									
A I	Wheat (Warsaw)	23 94	23 13	30 50	33 53	38 29	45 81	31 17	40 89
	Rye (Warsaw)	21 43	20 45	26 33	27 79	19 29	26 42	21 33	22 72
	Barley (Warsaw)	22 35	21 92	n. q.	n. 27 29	26 13	29 36	25 55	26 88
	Oats (Warsaw)	20 00	22 52	30 26	29 43	22 53	25 88	24 01	21 85
A II	Butter (Warsaw)	415	413	393	424	470	583	456	590
	Beef (Warsaw) (2)	88	79	81	85	116	139	103	131
	Pork (Warsaw) (2)	156	168	177	124	187	245	152	238
	Eggs (Warsaw) (8)	167	126	126	132	179	253	205	235
B I	Superphosphate (3)	0 82	0 82	0 82	0 82	0 84	0 90	0 83	0 89
	Potash salts 25 %	13 75	13 75	13 75	13 75	13 75	13 75	13 75	13 75
	Sulphate of ammonia	25 00	25 00	25 00	25 00	25 00	25 00	25 00	25 00
B II	Wheat bran (Warsaw)	14 70	14 56	15 00	21 11	15 50	19 65	16 53	16 64
	Rye bran (Warsaw)	12 30	13 15	15 00	21 06	11 35	17 90	14 19	13 34
	Linseed cake (Warsaw)	n. q.	n. q.	n. q.	31 50	n. 35 00	n. 44 40	31 41	39 86
	Rapeseed cake (Warsaw)	17 75	n. q.	n. q.	25 28	n. 22 50	n. 32 50	21 91	29 85

• (1) Dozen. — (2) Live weight. — (3) Prices for unit per quintal. — (4) Hectolitre. — (5) Early variety. — (6) 100 eggs. — (7) Dead weight. — (8) Box of 1440 eggs.

Groups	COUNTRIES AND PRODUCTS	Average						Agricultural year	
		IX	VIII	VII	IV-VI	VII-IX	VII-IX	1930-31	1929-30
		1931	1931	1931	1931	1930	1929		

SWEDEN (Prices in Swedish crowns per quintal)

A I	Wheat	15.95	20.25	20.25	20.22	18.57	19.26	19.39	18.31
	Rye	14.75	17.25	17.25	17.22	15.51	16.97	16.29	14.92
	Barley	11.62	17.73	18.56	13.66	12.22	15.77	12.25	13.40
	Oats	9.65	11.12	11.50	12.18	9.31	13.07	10.18	10.88
A II	Beef (Göteborg) (1)	43	46	46	47	57	59	52	50
	Pork (Göteborg) (1)	55	55	51	53	84	115	65	108
	Butter (Malmö)	192	190	178	184	233	288	210	262
	Eggs (Stockholm)	109	80	76	71	159	184	144	151
B I	Superphosphate, 20 %	n 7.07	n 7.07	n 7.07	7.78	7.80	7.90	7.46	7.85
	Potash salts, 20 %	7.85	7.85	7.85	7.95	8.10	8.40	7.92	8.25
	Chilic saltpeter	19.04	19.04	19.04	19.04	19.04	19.95	18.50	19.88
	Calcium cyanamide	18.10	18.10	18.10	18.10	18.10	18.90	18.10	18.40
B II	Maize, La Plata	7.25	7.56	8.02	8.86	12.42	17.66	10.07	14.73
	Wheat bran	8.81	8.55	8.50	10.30	9.20	12.91	9.55	11.12
	Groundnut cake	12.44	12.61	12.77	13.41	14.11	21.00	13.52	18.42
	Cottonseed cake	n 11.23	n 12.00	n 12.17	12.59	13.74	18.78	12.80	16.98
	Soya meal	12.80	13.36	13.43	14.13	14.48	19.87	14.08	17.37

CZECHOSLOVAKIA (Prices in Czech crowns per quintal)

A I	Wheat	130	150	160	157	161	176	149	172
	Rye	146	141	156	143	89	140	108	121
	Barley	120	142	142	148	124	151	134	138
	Oats	117	144	159	151	107	143	118	117
A II	Edible potatoes	27	44	112	44	62	64	42	37
	Hops	565	420	565	642	1,287	1,546	934	1,496
	Butter	2,300	2,250	2,300	2,217	2,217	2,116	2,170	2,150
	Fresh eggs (2)	876	792	792	812	924	1,125	1,067	1,125
	Beef (3)	950	950	950	925	942	1,225	981	1,156
	Veal (3)	850	775	875	921	967	1,242	481	1,219
	Pork (1)	900	1,050	875	858	1,200	1,533	1,014	1,445
B I	Basic slag, 15 %	..	..	36.97	37.05	40.87	41.25	39.21	40.03
	Superphosphate, 16 to 18 %	..	..	51.85	51.85	54.97	60.35	52.84	58.37
	Kainite, 14 %	..	..	23.90	23.70	22.22	23.58	23.10	23.62
	Chile saltpeter	..	..	170.50	169.80	168.83	167.82	165.16	169.46
B II	Sulphate of ammonia, 20 1/2 %	..	..	140.00	140.00	143.00	149.33	139.65	149.04
	Maize	60	66	71	73	100	148	80	120
	Wheat bran (Prague)	75	77	77	89	76	104	79	86
	Rye bran (Prague)	76	78	81	90	68	104	75	83
	Crushed soya (Prague)	115	116	118	128	142	184	133	164
	Rapeseed cake (Prague)	107	98	101	101	114	168	99	147
	Linseed cake (Prague)	125	127	129	133	149	201	137	182
	Groundnut cake (Prague)	123	123	124	123	145	197	125	174

(1) Live weight. — (2) 1440 eggs. — (3) Dead weight

THE PRICES OF AGRICULTURAL PRODUCTS DURING THE THIRD QUARTER OF 1931

In the following pages the index-numbers of prices of agricultural products and other price indices of interest to the farmer are given as published in the different countries. The indices collected together have been obtained according to different methods and criteria in the various countries. A detailed account of the items included in each series and the system of construction of the index-numbers may be found in the volume published especially for this purpose by the Institute, entitled « Index-numbers of prices of agricultural products and other price indices of interest to the farmer ». We refer the reader to this volume for an exact interpretation of the significance of the different series of data.

Owing to the substantial divergence which often exists in the value and significance of the indices available, much care is advisable in their utilization from an international point of view. For this reason it has been considered opportune to reproduce all the data in their original form only, without attempting to formally unite them. The latter process, by a comparison of often heterogeneous data, might easily lead to the drawing of erroneous relations and conclusions.

In any case, now that most of the index-numbers for June are available, a table is given below, corresponding to those published at the ends of the preceding quarters and containing the quarterly indices.

General index-numbers of prices of agricultural products

(Base: the first quarter of 1929 = 100).

COUNTRIES	1929		1930				1931		
	3rd Quarter	4th Quarter	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	1st Quarter	2nd Quarter	3rd Quarter
Germany	99.5	96.8	87.1	83.2	80.4	83.1	79.9	81.4	77.5
England and Wales . . .	102.8	99.3	100.0	93.1	95.1	88.9	87.5	85.4	83.8
Estonia . . .	93.3	89.4	80.0	71.1	69.3	64.9	64.0	64.0	64.0
Finland . . .	90.7	87.9	82.2	77.6	76.6	69.2	69.2	66.7	64.5
Hungary . . .	79.9	73.0	63.7	61.9	61.9	59.7	60.4	62.4	64.2
Italy . . .	90.2	88.2	82.3	77.3	75.4	69.5	63.7	65.1	61.4
Netherlands . .	101.4	97.1	89.3	84.6	86.4	78.9	77.1	78.2	70.7
Poland . . .	92.0	89.8	78.4	76.3	75.0	70.9	64.0	71.4	63.4
Argentina . . .	101.9	98.2	89.5	88.2	83.1	66.4	60.1	59.6	59.3
Canada . . .	100.1	106.1	99.7	92.6	78.3	68.6	61.9	60.2	55.6
Unit. Stat. Bu- reau of Agric. Economics . .	103.7	100.7	95.6	91.9	80.9	75.0	67.6	63.7	55.4
Unit Stat. Bu- reau of Labor	100.9	96.4	92.3	87.3	79.5	74.5	67.3	63.7	59.3
New Zealand . .	95.4	87.1	80.5	77.4	75.3	64.1	57.4	56.7	59.6

INDEX-NUMBERS OF PRICES OF AGRICULTURAL PRODUCTS AND OF COMMODITIES BOUGHT BY THE FARMER *

COUNTRIES AND CLASSIFICATION	Sept.	August	July	June	May	April	Sept.	Sept.	Year	
	1931	1931	1931	1931	1931	1931	1930	1929	1930 (1)	1929
GERMANY										
(Statistisches Reichsamt)										
1913 = 100.										
Foodstuffs of vegetable origin	111.7	114.6	126.1	129.8	131.8	129.7	116.7	124.8	115.0	126.3
Livestock	84.7	89.0	81.7	81.5	83.9	83.3	108.2	133.6	112.4	126.6
Livestock products	108.4	107.9	105.6	103.3	102.5	105.7	124.6	149.0	121.7	142.1
Feeding stuffs	96.8	98.3	104.7	114.5	120.0	113.9	96.8	120.1	93.2	125.9
Total agricultural products	101.1	103.4	105.4	107.3	109.2	108.3	113.5	132.6	113.1	130.2
Fertilizers	73.6	72.8	71.3	77.9	77.2	80.1	80.0	81.9	82.4	84.5
Agricultural dead stock	129.7	129.9	129.9	130.0	130.6	131.2	139.1	141.3	139.4	141.3
General index-number	103.6	110.2	111.7	112.3	113.8	113.7	122.8	138.1	124.0	137.2
ENGLAND AND WALES										
(Ministry of Agriculture)										
Average of corresponding months										
1911-13 = 100.										
Agricultural products	120	121	121	123	122	123	142	152	134	144
Feeding stuffs	76	77	81	82	87	88	90	133	96	139
Fertilizers	88	95	100	100	100	100	99	98	101	100
General index-number (2).		93.1	94.4	97.2	96.7	99.3	106.3	132.5	114.1	135.3
ARGENTINA										
(Banco de la Nación argentina)										
1926 = 100.										
Cereals and linseed	52.7	53.7	55.1	54.5	54.3	51.2	77.9	109.0	82.3	100.4
Meat	97.1	96.4	92.5	93.8	89.8	93.7	114.8	114.5	110.9	113.6
Hides and skins	54.4	59.3	63.1	64.1	63.1	70.5	70.6	91.2	71.6	95.0
Wool	54.3	55.8	52.4	54.8	57.6	57.7	64.9	96.3	67.4	103.5
Dairy products	75.8	84.8	84.0	74.8	73.4	73.6	80.8	109.3	82.4	106.9
Forest products	89.5	91.6	107.1	103.7	108.7	103.7	107.7	111.8	107.9	111.5
Total agricultural products	60.9	62.2	62.9	62.8	62.6	61.4	82.8	107.6	85.5	102.6
CANADA										
(Internal Trade Branch										
of the Dominion Bureau of Statistics)										
1926 = 100.										
Field products (grain, etc.)	41.1	43.0	44.8	47.3	48.2	47.3	58.2	104.7	70.0	93.3
Animals and animal products	72.5	74.3	73.2	73.1	76.9	81.8	92.9	112.7	102.9	112.5
Total Canadian farm products	52.3	54.7	55.4	56.9	58.9	60.2	71.2	107.7	82.3	100.8
Fertilizers	74.8	86.8	86.9	86.9	86.9	86.5	91.5	81.7	88.2	92.6
General index-number	70.0	70.9	71.7	72.2	73.0	74.4	82.1	97.8	86.6	95.6
ESTONIA										
(Central Bureau of Statistics)										
1922 = 100.										
Commodities imported	87	.	92	93	91	90	74	91	79	95
Commodities exported	60	...	62	64	62	63	85	118	83	113
Agricultural products imported and exported	69	..	71	73	71	72	78	108	79	106

* For an explanation of the method of calculation of the index-numbers, reference should be made to the Institute's publication "Index-numbers of Prices of Agricultural Products and other Price-indices of interest to the Farmer" (Rome, 1930).
(1) Some data are provisional. — (2) Calculated by the "Statist", reduced to base-year 1913 = 100.

COUNTRIES AND CLASSIFICATION	Sept.	August	July	June	May	April	Sept.	Sept.	Year	
	1931	1931	1931	1931	1931	1931	1930	1929	1930	1929
UNITED STATES (Bureau of Agricultural Economics) Average 1909-10 to 1913-14 = 100.										
Cereals	50	54	57	67	74	74	100	131	100	121
Fruits and vegetables	83	97	110	114	119	120	148	160	158	186
Meat animals	86	92	92	91	99	106	128	156	124	156
Dairy products	92	87	85	86	91	99	128	139	123	140
Poultry and poultry products	99	93	83	81	77	90	125	165	126	159
Cotton and cottonseed	47	53	71	65	74	78	83	146	102	145
Total agricultural products	72	75	79	80	86	91	111	141	117	136
Commodities purchased by farmers (1)	127	127	129	130	131	134	149	155	146	155
Agricultural wages (1)	—	—	—	123	—	—	150	(2) 174	152	170
UNITED STATES (Bureau of Labor) 1926 = 100.										
Grains	44.2	44.8	49.0	56.0	59.6	59.5	77.0	101.6	58.3	97.4
Livestock and poultry	61.0	67.0	63.0	61.9	64.1	70.3	88.0	106.6	89.2	106.1
Other farm products	63.4	67.3	71.3	70.8	71.5	73.4	86.4	108.3	91.1	106.6
Total farm products	60.5	63.5	64.9	65.4	67.1	70.1	83.3	106.6	83.3	104.9
Agricultural implements	94.5	94.5	94.5	94.6	94.7	94.7	94.9	98.2	95.1	97.9
Fertilizer materials	74.2	74.4	78.7	79.8	80.5	80.6	83.1	89.9	85.6	92.1
Mixed fertilizers	77.6	78.7	80.2	82.4	82.8	83.5	92.5	97.8	98.6	97.2
Cattle feed	44.4	50.8	55.8	61.1	67.9	81.2	93.6	132.5	99.7	121.6
Non-agricultural commodities	71.7	72.1	71.5	71.4	72.6	74.3	84.0	95.1	85.9	94.4
General index-number	69.1	70.2	70.0	70.0	71.3	73.3	84.2	97.5	86.3	96.5
FINLAND (Central Bureau of Statistics) 1926 = 100.										
Cereals	70	76	79	78	79	78	60	92	76	98
Potatoes	50	84	101	73	88	69	54	84	76	145
Fodder	52	60	65	65	67	71	60	69	62	69
Meat	59	64	63	66	67	66	55	93	83	103
Dairy products	73	72	70	70	71	73	88	107	84	103
Total agricultural products	66	70	71	70	71	73	71	95	82	100
General index-number	79	81	82	83	84	85	88	96	90	98
HUNGARY (Central Bureau of Statistics) 1913 = 100.										
Agricultural and livestock products	88	83	87	82	85	84	80	100	—	—
General index-number	96	92	95	91	93	93	92	109	—	—
ITALY (Consiglio Provinciale dell'Economia Corporativa di Milano) 1913 = 100.										
National agricultural products	334.23	330.21	337.05	348.32	357.20	356.36	409.33	479.72	413.39	508.76
General index-number	330.33	331.42	337.43	339.33	347.16	353.10	398.30	472.31	411.04	480.69
NEW ZEALAND (Census and Statistics Office) Average 1909-13 = 100.										
Dairy produce	102.9	108.7	98.7	88.8	93.6	89.4	113.7	138.6	120.7	145.7
Meat	120.7	127.9	128.0	125.7	126.5	128.1	153.3	168.1	164.7	178.9
Wool	63.0	68.9	73.2	74.2	76.7	76.6	95.5	146.7	100.7	170.9
Hides, skins, and tallow	79.8	82.1	83.4	88.2	95.1	84.0	104.2	178.4	145.4	188.6
Miscellaneous	109.8	98.9	122.1	129.2	130.7	134.1	130.9	138.6	134.0	148.7
Total agricultural products	99.7	100.5	100.1	99.3	96.2	90.0	117.8	151.4	126.7	161.3

(1) 1910-14 = 100. — (2) October.

COUNTRIES AND CLASSIFICATION	Sept	August	July	June	May	April	Sept	Sept	Year	
	1931	1931	1931	1931	1931	1931	1930	1929	1930 (1)	1929
NORWAY										
(Kgl. Selskap for Norges Vel)										
Average 1909-14 = 100										
Cereals	111	112	111	108	107	105	118	162	(2) 114	(2) 155
Potatoes	97	170	257	165	157	167	200	90	(2) 152	(2) 120
Pork	86	91	83	76	73	74	66	140	(2) 98	(2) 141
Other meat	137	153	160	153	166	162	203	190	(2) 135	(2) 199
Eggs	117	87	81	77	83	85	124	154	(2) 121	(2) 135
Dairy products	127	126	125	126	124	133	157	172	(2) 150	(2) 161
Concentrated feeding stuffs	97	102	103	105	108	111	122	156	(2) 117	(2) 148
Maize	71	79	81	87	85	85	114	160	(2) 103	(2) 148
Fertilizers	81	85	96	96	96	96	90	100	(2) 101	(2) 108
NETHERLANDS										
(Directie van den Landbouw)										
Average 1924-25 to 1928-29 = 100.										
Products of the soil	57	61	67	71	83	78	73	78	(3) 67	(3) 68
Animal products	64	68	70	71	72	74	83	100	(3) 77	(3) 95
Total agricultural products	62	67	69	71	74	75	81	95	(3) 75	(3) 88
Agricultural wages	95	95	95	95	95	95	100	100	(3) 90	(3) 100
General index-number (4)	61.6	63.7	65.6	67.7	69.0	69.0	73.8	95.4	79.2	96.1
POLAND										
(Central Bureau of Statistics)										
1927 = 100.										
Products of the soil	46.6	47.7	48.2	62.8	63.3	64.7	49.9	68.5	52.1	73.1
Products of agricultural industry	60.1	62.1	64.1	72.9	77.2	75.4	64.9	75.8	69.9	80.9
Total products of plant origin	33.3	34.8	36.0	68.1	73.1	70.8	37.1	69.4	60.5	76.9
Animals	59.3	66.2	67.0	60.5	56.2	55.9	79.9	103.5	82.4	98.4
Dairy products	68.3	61.2	59.2	57.5	65.1	61.6	79.0	103.2	81.5	102.9
Total products of animal origin	61.3	64.2	63.6	59.3	60.1	58.5	79.6	103.4	81.9	100.2
Total agricultural products	56.2	53.3	58.8	63.8	66.8	64.5	65.5	82.0	68.5	85.7
Fertilizers	118.5	118.5	118.5	118.5	124.7	124.7	126.2	130.6	127.8	126.5
Industrial products	77.1	78.0	80.2	80.8	81.3	82.1	91.8	102.9	94.0	108.3
General index-number	67.4	69.1	70.4	73.2	74.8	74.1	79.6	93.9	82.3	95.7
YUGOSLAVIA										
(National Bank)										
of the Kingdom of Yugoslavia)										
1926 = 100.										
Products of the soil	70.4	75.7	78.9	77.8	80.5	77.6	78.0	102.9	89.3	118.6
Animal products	70.6	75.6	74.7	71.7	73.2	75.4	95.6	107.2	96.3	107.2
Industrial products	72.2	70.8	71.3	71.7	73.0	73.9	78.2	90.2	81.8	92.6
General index-number	71.6	73.6	74.4	73.8	75.4	75.5	82.8	96.2	86.6	100.6

(1) Some data are provisional. — (2) Agricultural year April 1-March 31. — (3) Agricultural year 1-July June 30. — (4) Calculated by the Central Statistical Bureau of the Netherlands, reduced to the base 1925-1929 = 100.

RATES OF FREIGHT

(Rates for full cargoes).

VOYAGES	Oct 16, 1931	Oct 9, 1931	Oct 2, 1931	Sept. 25, 1931	Average			Commercial Season
					Sept. 1931	Oct 1931	Oct 1929	
								1930-31 1929-30
SHIPMENTS OF WHEAT AND MAIZE.								
Danube to Antwerp/Hamburg (shill er	14 6	n 14 6	n 14 6	14 6	14 11	14 3	18 1	18 11 15/8
Black Sea to Antwerp/Hamburg (2240 lbs.)	n 11 6	n 11 6	n 11 3	11 6	11 1	11 4	n. q.	10 10 n. q.
St. John to Liverpool (1)	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	1 6 1/5
Montreal to United Kingdom	2 4 1/2	2 3	1 10 1/2	1 9	1 8	1 10	1 10	1 10 1/10
Gulf to United Kingdom (shill per	1 0	2 0	n 2 4 1/2	2 3	2 1	(r) 2 7	2 8	2 3 2/6
New York to Liverpool (1) (480 lbs)	1 6	1 6	1 6	1 6	1 6	1 6	1 6	1 6 1/6
North Pacific to U K and Continent	2 1	2 1	n 1 9	n 1 7 1/2	1 7 1/2	n. q.	n. q.	1 1/2 1/9
North Pacific to United Kingdom (shill per 2240 lbs).	2 1	2 1	n. q.	n. q.	n. q.	n. 23 1	n 24 7	22 3 22 7
Vancouver to Yokohama (1) (s. canad p. sh. ton) .	n 2 35	n. 2 35	n. 2 35	2 25	2 51	3 10	3 10	2 72 2 78
La Plata Down River (2) to U. K./Continent	17 -	17 3	17 3	17 -	18 4 1/2	18 2	12 4	18 4 12 8
La Plata Up River (3) to U. K./Continent (shill per	16 -	16 -	19 -	19 -	18 1	15 2	14 -	18 - 14 4
Karachi to U. K./Continent (4) (2240 lbs)	(s) 22 6	(s) 22 6	n. q.	n. q.	n. q.	18 6	n. q.	19 3 n 15 4
Western Australia to U. K./Continent	20 -	27 6	n. 24 6	n. 24 -	n. 23 0	n. 32 -	n 30 -	20 8 25 7
SHIPMENTS OF RICE.								
								1930 1929
Saigon to Europe (shill per	17 20 -	17 20 -	n. q.	n. q.	n. q.	17 20 5	n. q.	n 18 11 n. 26 1
Burma to U. K./Continent (2240 lbs.)	n. q.	n. q.	n 20 -	n 20 -	n. q.	n. q.	n. q.	n. 17 8 n. q.

(1) Rates for parcels by liners. — (2) "Down River", includes the ports Buenos Aires and La Plata. — (3) "Up River", include the ports on the Paraná River as far as San Lorenzo. Cargoes from ports beyond San Lorenzo (Colastine, Santa Fe and Paraná) are subject to an extra rate of freight. — (4) The original data being quoted in "scale terms", 10% is added to arrive at freights per 2,240 lbs. — (5) Rates on the basis of 'dead weight'.

EXCHANGE RATES

PERCENTAGE OF PREMIUM (+) OR OF LOSS (—) OF DIFFERENT CURRENCIES IN RESPECT OF THEIR PARITY WITH THE DOLLAR (1).

COUNTRY	Exchange	October 16, 1931	October 9, 1931	October 2, 1931	September 25, 1931
Germany	Berlin	—	0.4	—	0.4
Argentina	Buenos Aires	—	48.7	—	46.7
Belgium	Brussels	—	1.8	—	0.6
Canada	Montreal	—	10.9	—	11.9
Denmark	Copenhagen	—	18.4	—	20.0
Egypt	London	—	20.7	—	28.6
France	Paris	+	0.5	+	0.5
Great Britain	London	—	20.7	—	28.6
Hungary	Budapest	—	0.0	—	0.6
India	London	—	21.6	—	21.1
Indo-China	Paris	+	0.5	+	0.5
Italy	Milan	—	1.0	—	2.6
Japan	New York	—	1.1	—	1.2
Netherlands	Amsterdam	+	0.9	—	0.1
Rumania	London	+	0.9	+	0.8

(1) The percentage represents the premium or the loss as far as possible on the national exchange. On page 658 of this Bulletin may be found the table of reciprocal pairs of the currencies considered; by the aid of this table and the percentages indicated above, it is possible to obtain the reciprocal prices of the different currencies at the rates to which the quotations of the Monthly Review refer.

RECIPROCAL PARITIES OF THE VARIOUS CURRENCIES IN WHICH ARE QUOTED THE PRICES IN
THE MONTHLY AND THE QUARTERLY PRICE REVIEWS (1).

COUNTRIES	Unit of Currency	Germany	Argentina	Belgium	Canada United States	Denmark	Egypt	France Indo China	Great Britain	Hungary	India	Italy	Japan	Netherlands	Poland	Russia	Czechoslovakia	Former Latin monetary union (3)
Germany	Reichsmark	1	0.561	8.566	0.298	0.889	4.819	0.089	0.979	1.352	0.653	1.526	0.178	0.593	2.123	39.875	8.010	1.265
Argentina	Paper peso	1.782	1	15.263	0.424	1.584	8.586	10.832	1.744	2.427	1.163	8.061	0.851	1.056	3.872	70.959	11.326	2.200
Belgium	Franc	0.117	0.065	1	0.028	0.104	0.503	0.710	0.111	0.159	0.076	0.528	0.056	0.069	0.218	4.619	0.989	0.115
Canada	Dollar	4.198	2.356	35.959	1	3.731	20.230	25.521	4.110	5.718	2.740	19.000	2.006	2.488	8.914	167.181	23.751	5.183
United States																		
Denmark	Crown	1.125	0.631	9.637	0.208	1	5.122	6.840	1.101	1.592	0.734	5.092	0.538	0.667	2.389	44.803	9.015	1.389
Sweden																		
Egypt	Piastre	0.207	0.016	1.777	0.019	0.184	1	1.262	0.203	0.283	0.135	0.939	0.099	0.123	0.411	8.261	1.608	0.256
France	Franc	0.164	0.092	1.409	0.039	0.116	0.793	1	0.161	0.224	0.107	0.714	0.079	0.097	0.419	6.550	1.422	0.203
Indo-China	Piastre (2)																	
Great Britain	Shilling	1.021	0.573	8.750	0.213	0.968	4.923	6.211	1	1.391	0.667	4.622	0.488	0.605	2.163	40.680	8.213	1.261
Hungary	Pengo	0.734	0.412	6.280	0.175	0.653	3.250	4.464	0.720	1	0.479	3.323	0.351	0.435	1.529	29.240	5.402	0.906
India	Ruppee	1.532	0.860	13.125	0.365	1.362	7.381	9.316	1.500	2.087	1	6.435	0.732	0.908	3.254	61.020	12.319	1.832
Italy	Lira	0.291	0.124	1.892	0.053	0.196	1.065	1.343	0.216	0.301	0.141	1	0.106	0.131	0.469	8.799	1.776	0.273
Japan	Yen	2.092	1.174	17.924	0.408	1.860	10.054	12.723	2.049	2.850	1.369	9.471	1	1.210	4.413	83.353	16.824	2.583
Netherlands	Florin	1.087	0.917	14.454	0.404	1.450	8.132	10.200	1.632	2.298	1.101	7.637	0.806	1	3.581	67.200	13.567	2.083
Poland	Zloty	0.471	0.264	4.034	0.112	0.419	2.269	2.863	0.461	0.641	0.307	2.131	0.225	0.279	1	18.755	3.786	0.581
Rumania	Lei	0.025	0.014	0.215	0.006	0.022	0.121	0.153	0.055	0.084	0.016	0.114	0.012	0.015	0.053	1	0.302	0.031
Czechoslovakia	Crown	0.124	0.070	1.065	0.030	0.111	0.339	0.756	0.122	0.169	0.081	0.563	0.059	0.079	0.674	0.264	4.953	1
Former Latin monetary union (3)	Gold Franc	0.810	0.455	6.938	0.193	0.730	3.303	4.925	0.793	1.103	0.529	3.666	0.387	0.489	1.720	32.258	6.512	1

(1) Each figure gives the number of units of the currency indicated at the head of each vertical column corresponding to the unit of the currency indicated at the side of each horizontal line. — (2) 1 Gold piastre equal to 10 francs. — (3) Data for purpose of comparison.

MONTHLY CROP REPORT

AND AGRICULTURAL STATISTICS

The following notes refer to crop conditions quoted in the crop reports and in the tables — Crop condition according to the system of the country: Germany, Austria, Hungary, Luxemburg and Czechoslovakia: 1 = excellent, 2 = good, 3 = average, 4 = bad, 5 = very bad; France: 100 = excellent, 70 = good, 60 = fairly good, 50 = average, 30 = bad; Lithuania, Poland, Sweden and Switzerland: 5 = excellent, 4 = good, 3 = average, 2 = bad, 1 = very bad; Netherlands: 90 = excellent, 70 = good, 60 = fairly good, 50 = below average; U. S. S. R.: 5 = good, 4 = above the average, 3 = average, 2 = below average, 1 = bad; United States: 100 = crop condition which promises a normal yield. — For other countries the system of the Institute is employed: 100 = crop condition which promises a yield equal to the average of the last ten years.

WORLD PRODUCTION OF CEREALS

The estimates received in November, which complete and revise those possessed last month, permit a more exact calculation of this year's cereal crop results.

WHEAT. — As regards wheat, the total European crop, on the basis of the preliminary estimates of France, Greece and Portugal, of the small increase made for Hungary and Estonia and of the slight decrease for Germany, does not differ greatly from the figure estimated last month, reaching 842 million centals (1,405 million bushels) against 840 (1,400) calculated approximately in October.

Owing to the very small difference between these estimates it does not appear to be necessary to modify the forecast of the quantity required to cover European requirements, which was estimated at 390 million centals (640 million bushels). Other factors also lead to this conclusion. In the first place, no modification has taken place in the factors on which the estimate was based, such as the good price of wheat compared with last year and information on the greatly reduced volume of invisible stocks in Europe at the beginning of the season.

Moreover, it has been confirmed that the European rye crop is really very small, showing a decrease of over 90 million centals (160 million bushels) compared with last year and nearly 65 million centals (120 million bushels) compared with the average of 1925-1929. The scarcity of this cereal, which is used predominantly for bread making in vast regions of Europe, cannot fail to bring about a larger consumption of wheat, of which large supplies are available at low prices, especially as, owing to the very poor North American crops, there is no other source of supply of rye in the world apart from the U. S. S. R. and this country not only does not possess sufficient supplies to cover the whole of European rye requirements but also finds it more convenient to export wheat, which obtains better prices on the market than rye. Lastly there are now available the statistics of wheat shipments destined for Europe during the first quarter of the season, which form a further basis for the calculation of probable total imports during the season. It is found that during the period August 1-October 31, 1931 there was shipped to Europe about 100 million centals (165 million bushels), which would give for the whole year, on the hypothesis that such shipments are continued at an equal rate, a total of 400 million centals (660 million bushels), a figure which corresponds approximately to our forecasts. It remains to be seen, however, whether the ship-

Production of Wheat.

COUNTRIES	1931	1930	1929	1928	1927	1926	1925
(Million centals:							
Europe	842	821	871	847	765	732	842
North America	719	763	675	895	822	749	648
Asia	245	273	229	205	236	229	231
Africa	77	72	82	71	71	64	71
South America	165	165	132	243	203	163	143
Australasia	106	132	82	101	77	101	71
Totals	2,154	2,226	2,071	2,362	2,174	2,039	2,006
(Million bushels:							
Europe	1,405	1,365	1,463	1,411	1,275	1,216	1,403
North America	1,200	1,272	1,124	1,492	1,371	1,249	1,080
Asia	410	455	382	342	393	382	386
Africa	130	118	135	118	118	107	118
South America	250	276	220	404	338	272	239
Australasia	175	220	136	169	128	169	118
Totals	3,590	3,712	3,450	3,936	3,623	3,905	3,344

ments to Europe will be maintained at as high a level during the following quarters as in the first. In the last two seasons, shipments in the first quarter destined to Europe were also very large but dropped in the following months to give a total for the whole season somewhat smaller than that calculated on the basis of the first quarter. It should not, however, be forgotten that particularly in the last two seasons, despite the action of the Canadian Pool and the subsequent operations of the Federal Farm Board, wheat prices have shown a tendency to fall, inducing European importers to regulate their purchases day by day to the indispensable minimum. In years of normal development of grain traffic, on the contrary, exports to Europe in the first quarter of the season were generally lower than in the following quarters as the bulk of withdrawals for consumption were taken from the home supplies. This year, due to the fall in the price of wheat to a very low level, the grain traffic should be influenced by factors different from those of the last two seasons and the volume of exports in the first quarter may be considered to be representative, pro rata, of the total for the season. It is, however, observed that part of the shipments in the first quarter of the current season cannot be considered as having been consumed because there has taken place an increase in stocks lying at English ports, which on November 1 1931 amounted to 16 million centals (28 million bushels) whereas at the corresponding period of last year they amounted to only 5 million centals (9 million bushels). While admitting this accumulation of stocks it must not be overlooked that the demands of some large European consumers have until now been greatly reduced by regulations providing for the compulsory use of home grain in flour milling, and that these demands should recover in subsequent months when the restrictions have been reduced or abolished. Neither must the fact be neglected that at the present level of prices some importing countries may be induced to replenish to a normal level their carry-over stocks at the end of the season, which had been ultimately reduced to the indispensable minimum. In conclusion, owing to the confirmation of the estimate of European wheat production, to the poor rye crop, and the volume of shipments in the quarter August-October, the opinion may be held that the forecast of European requirements should not at present be modified.

In North America, Canada last November modified the estimate of production on the basis of the results of the agricultural census. This modification brings an increase of 15 million centals (26 million bushels) on the October estimate. It cannot be asserted that the increase calculated for production necessarily involves a corresponding increase in the quantities exportable from Canada, on the contrary it is not improbable that it serves only to correct the underestimation of home consumption, due in its turn to the underestimation of production in 1930 (1). For this reason the estimate of quantities exportable from North America has not been changed.

With respect to the U. S. S. R.; there is at present no estimate available of production during the season; wheat shipments, which assumed large proportions during last August and September, later slackened, dropping in the last few weeks to quantities much below those of last year. At the middle of November there were shipped abroad about 34 million centals (57 million bushels) of Russian grain. Owing to this trend of exports, we do not consider it opportune at present to make any change in the estimate of supplies exportable from the U. S. S. R.

As regards Asia the crop estimate remains practically unchanged, while that of Africa has undergone a slight increase owing to the better crops in Egypt and Algeria.

In the southern hemisphere the crops are fairly good both in Argentina and Australia. In the former country there have been losses of a local character through bad weather; for the most part, however, these have occurred in regions such as the Pampa that have small importance in wheat growing. On the other hand in the greater part of the wheat zone the more serious danger of spring drought, to which are due the major fluctuations of Argentine production, seems to have been avoided. On the basis of this general information the harvest should not be greatly divergent from the 140 million centals (220 million bushels) estimated last month. For Australia there is now an official forecast, which places the crop at 102 million centals (170 million bushels), a figure somewhat higher than that estimated by us last month. It is necessary, therefore, to modify the estimate of the amount available for export from Australia, previously calculated at 75 million centals (130 million bushels), bringing it to 90 million centals (150 million bushels), in correspondence with the increase in the production estimate.

In short, the world supplies available for export in 1931-32 are now placed at 755 million centals (1,260 million bushels) against the 740 million centals (1,240 million bushels) of last month while import demands remain unchanged at 530 million centals (880 million bushels). Residual stocks at the end of the season in August 1932 should,

(1) If, in fact, a calculation is made of the home consumption of Canada in the season 1930-31 on the basis of the production data, of the difference in stocks at the beginning and end of the season and of the data of exports, a total is obtained of 71 million centals (119 million bushels), which is evidently below the actual consumption. As the factors used in the calculation may be considered to be exact as far as regards stocks and exports, any error occurring would be due to the figure of production. The same Canadian authorities have recently admitted that the estimate of production in 1930 was at least 10 million centals (20 million bushels) too small. There is now available the estimate of production in 1931 revised on the basis of the census while the estimate of production in 1930 has not yet been revised on the same basis and it seems that it will not be until next January. This revision can only bring an increase in the estimate of production in 1930 and consequently an increase in the figure of home consumption in 1930-31, which should not therefore differ greatly from 90 million centals (150 million bushels). Adopting this figure for the probable home consumption of Canada during the current season 1931-32, the supplies exportable from North America would remain unchanged at the amount calculated last October (440 million centals or 735 million bushels). It may here be observed that in calculating, last year, the forecast of supplies exportable from Canada (Crop Report and Agricultural Statistics, November 1930) the figure taken as basis for the Canadian home consumption in 1930-31 was 88 million centals (147 million bushels).

however, reach 225 million centals (380 million bushels) against 330 (550) in August 1931.

As regards autumn sowings these have been effected under prevalently good conditions in almost all European countries and the areas cultivated for wheat, while it is still impossible to have estimates, seem to have been maintained almost at the levels of last year; in France there appears to be an increase, in Rumania a decrease. In the U. S. S. R. also autumn sowings have been carried out in satisfactory conditions. In North America several important winter wheat districts suffered from drought in October and some centres had rains only in the latter half of November. The reduction in area sown seems to be fairly heavy. In Canada sowings of winter wheat, which, as is well-known, have very small importance, have been diminished by about $\frac{1}{3}$ in comparison with last year. In Mexico too a contraction in the wheat area is expected. In North Africa sowings have been hindered by drought, which ended only in the last days of October; in Morocco an increase in the wheat area is expected.

RYE. — As regards rye, production in 1931 appears, on the basis of data now covering all the producing countries of the northern hemisphere save the U. S. S. R., to be one of the lowest in the last ten years. Production in the southern hemisphere is negligible and oscillates around 5 million centals (8 million bushels) a year.

Production of Rye.

COUNTRIES	1931	1930	1929	1928	1927	1926	1925
(Million centals).							
Europe	427	518	528	507	455	427	537
North America	24	39	31	32	41	30	31
Totals . . .	451	557	559	539	496	457	568
(Million bushels).							
Europe	762	926	943	905	813	762	959
North America	42	70	55	58	74	53	56
Totals . . .	804	996	998	963	887	815	1,015

Almost all the European countries, but especially the larger producers, have a very poor crop, due on the one hand to the contraction of the area sown, a contraction which in all amounts to about 3 million acres, and on the other to the reduction in unit yields due to the bad weather at the time of ripening and harvest. European production has diminished by 91 million centals (164 million bushels) in comparison with that of last year, that is, by almost one-fifth, and by 64 million centals (115 million bushels) in comparison with the average for 1925-29. In North America also the crop shows a heavy falling off; after having attained a maximum production of almost 77 million centals (137 million bushels) in 1922 it has declined steadily and this year has given the lowest figure since 1912. For production in the U. S. S. R. official estimates are lacking; it should, however, be fairly abundant, notwithstanding the reduction of over 2 million acres in area sown due to the good yield of winter crops this year.

BARLEY. — For barley the data of production in the northern hemisphere are not yet complete for certain countries in Asia and Africa; however, they may on the whole be considered as representative of the entire production of the northern hemisphere.

excluding the U. S. S. R., China and Turkey, and covering about 95 % of the total. Production in the southern hemisphere is of small importance, oscillating around 20 million centals (40 million bushels) a year

Production of Barley.

COUNTRIES	1931	1930	1929	1928	1927	1926	1925
(Million centals).							
Europe	336	366	397	357	316	323	322
North America	137	227	196	239	176	139	146
Asia (3 countries)	63	65	68	62	64	65	66
Northern Africa (5 countries)	48	44	54	54	44	38	54
Totals	584	702	715	712	600	565	588
(Million bushels).							
Europe	701	762	827	743	659	674	672
North America	286	472	408	498	367	289	305
Asia (3 countries)	131	135	142	129	133	135	138
Northern Africa (5 countries)	101	92	113	112	92	80	112
Totals	1,219	1,461	1,490	1,482	1,251	1,178	1,227

The European production of barley, despite the fact that the area is greater than in 1930, is this year very poor, both in comparison with that of last year and with the average. Almost all the European countries have registered a rather poor crop, especially the larger exporters, which have suffered heavy losses, particularly in the case of Rumania and Czechoslovakia.

The North American crops, damaged by spring drought, have also, and to an even greater extent than the European, been very poor; those of Asia and Africa appear to be generally mediocre, given the incomplete data available. The crop in the U. S. S. R., for which estimates are still wanting, does not seem to have been abundant, owing to decrease in area and to the reduction in the yields of the spring crops through the drought of June and July. It may, therefore, be asserted that the world production of barley in 1931 is one of the smallest recorded in recent years.

OATS. — For oats data of production are available for all the producing countries of the northern hemisphere, excluding the U. S. S. R. and the few Asiatic countries that grow the crop, which for that matter have little importance, producing on the average only about 10 million centals (25 million bushels) a year. There are also lacking the data for the southern hemisphere, which produces around 35 million centals (100 million bushels) a year.

European production in 1931, though slightly larger than last year, seems to be poor in comparison with that of the preceding quinquennium, from the mean of which it differs by 35 million centals (100 million bushels). In North America the crop is still poorer, being one of the worst recorded in the last twenty years. Production in the U. S. S. R., of which data are not yet available, does not seem to have been abundant. On the whole the production of oats in the northern hemisphere is the lowest since 1924.

Production of Oats

COUNTRIES	1931	1930	1929	1928	1927	1926	1925
(Million centals).							
Europe	558	553	660	602	550	587	546
North America	488	578	480	614	528	520	613
Africa (3 countries)	5	7	7	6	4	4	6
Totals	1,051	1,138	1,156	1,222	1,091	1,120	1,165
(Million bushels).							
Europe	1,748	1,728	2,061	1,882	1,748	1,835	1,706
North America	1,526	1,808	1,529	1,620	1,650	1,654	1,915
Africa (3 countries)	16	21	22	19	14	12	20
Totals	3,285	3,557	3,612	3,821	3,412	3,501	3,641

* * *

Summarising the information regarding the crops by continents, it may be said that in Europe, apart from wheat, which shows a production of 25 million centals (40 million bushels) above that of last year and the average, cereals have given a poorer output in comparison with both that of last year and the average, especially in the case of rye. In North America all four cereals have given a production notably inferior to both that of last year and the average. In Asia the production of wheat has been lower than that of last year but is somewhat above the average; for barley the incomplete data show an output almost average. In Africa the production of wheat and of barley is slightly above that of 1930 and the average. In all the production of cereals in 1931 in the northern hemisphere, taking into account the general information on crops in the U. S. S. R., is amongst the lowest in recent years.

G. CAPONE.

CEREALS

Germany: The dry weather that prevailed in October generally favoured preparatory work. Sowings have made good progress almost everywhere. Those that were enabled to be made early have sprouted regularly.

Crop condition at the beginning of November, compared with that at the same date in 1930, was as follows: wheat: 2.7 (2.6); rye: 2.7 (2.7)*; barley: 2.6 (2.6) and spelt 2.8 (2.7).

Austria: During the first half of October mild, calm weather predominated. A fall in temperature which occurred at the middle of the month was accompanied by not very abundant precipitation. In the last ten days of the month the weather was in general very cold with some strong winds. Winter cereal sowings were effected rapidly and at the end of the month there remained to be sown only those fields from which the crops of potatoes, turnips, cabbage, etc., had just been harvested. The varieties

Cereals.

COUNTRIES	(1) AREA					(2) PRODUCTION							
	1931	1930	Average 1925 to 1929	1931 % 1931/32		1931	1930	Average 1925 to 1929	1931	1930	Average 1925 to 1929	1931 % 1931/32	
	—	—	—	—	—	—	—	—	—	—	—	—	—
	1931/32	1930/31	1925/26 to 1929/30	1930/ 1931	Aver. = 100	1931/32	1930/31	1925/26 to 1929/30	1931/32	1930/31	1925/26 to 1929/30	1930/ 1931	Aver. = 100
	1,000 acres					1,000 centals			1,000 bushels				
WHEAT													
Germany	5,355	4,402	4,067	121.7	131.6	93,329	83,531	71,859	155,545	139,216	119,763	111.7	129.9
Austria	507	508	504	99.8	100.6	5,631	7,205	6,786	9,384	12,008	11,309	78.2	82.0
Belgium	396	411	375	96.3	105.5	9,133	7,942	8,879	15,255	13,236	14,799	115.3	103.1
Bulgaria	2,964	3,006	2,662	98.6	111.3	36,718	34,301	24,255	61,195	57,317	40,474	106.8	151.2
*Denmark	259	240	247	104.0	104.8	...	6,130	6,229	...	10,216	10,382	...	...
Spain	10,372	11,134	10,704	97.7	101.6	78,467	88,021	87,700	180,775	146,699	146,179	89.1	89.5
Estonia	99	90	66	109.6	130.6	980	981	605	1,633	1,635	1,009	95.9	161.8
Finland	47	51	43	92.7	110.0	606	726	601	1,161	1,210	1,002	95.9	115.8
*France	12,494	13,202	12,240	94.7	94.4	161,781	138,673	174,815	269,690	231,118	201,353	116.7	92.5
*Engl. and Wales .	1,197	1,346	1,491	88.9	80.3	21,571	23,972	29,677	35,952	39,954	49,460	60.0	72.7
*Scotland	3	54	56	94.6	91.8	...	1,277	1,322	...	2,128	2,208	...	...
North Ireland . .	51	5	5	67.1	62.7	...	102	107	...	171	178	...	...
*Greece . . . . .	...	1,312	1,251	...	...	7,337	7,229	7,334	12,228	12,048	12,223	101.5	100.0
Hungary	4,133	4,137	3,821	93.7	108.2	41,513	50,604	47,726	69,187	84,388	79,542	82.0	87.0
Italy	12,075	11,917	12,156	101.3	99.3	148,763	126,044	137,324	247,993	210,699	229,203	118.0	108.2
Latvia	215	179	139	120.2	154.3	2,101	2,439	1,850	3,502	4,068	2,299	86.1	152.3
Lithuania	470	520	352	89.3	133.6	4,894	6,796	3,647	8,156	11,327	6,079	72.0	134.2
Luxemburg	23	25	30	89.2	74.8	243	265	344	406	442	573	91.7	70.8
Malta	10	9	9	104.8	105.8	166	182	175	277	303	292	91.6	94.9
Norway	29	30	25	94.2	113.3	451	432	358	752	720	646	104.4	116.3
Netherlands . . .	191	142	135	134.4	141.1	3,701	3,634	3,623	6,268	6,056	6,037	103.5	103.8
Poland	4,012	4,063	3,304	93.7	121.4	45,415	49,384	36,305	75,601	82,321	60,508	91.9	125.1
*Portugal . . . .	...	1,120	1,071	...	...	7,226	8,230	6,102	12,042	13,817	10,171	87.2	118.4
Rumania	5,365	7,551	7,746	110.8	108.0	76,721	78,464	63,319	127,868	130,770	105,530	97.3	121.2
Sweden	634	646	483	105.9	140.2	11,773	12,832	9,381	19,621	21,469	15,635	91.4	125.5
Switzerland (1) .	179	180	171	99.6	104.6	3,565	3,481	3,357	5,941	5,769	5,595	103.0	106.2
Czechoslovakia . .	1,873	1,975	1,869	100.2	105.9	22,991	30,364	23,686	38,317	50,606	47,809	75.7	80.1
Yugoslavia	5,390	5,365	4,703	100.5	114.5	50,848	43,197	43,593	84,746	80,326	60,986	105.5	104.6
Total Europe . . .	71,935	70,943	63,105	101.1	105.3	821,331	793,600	739,664	1,369,193	1,339,975	1,316,082	102.9	104.1
*U. S. S. R. . . .	92,869	83,795	71,278	110.2	129.6	...	650,366	477,453	...	1,083,821	795,739	...	...
Canada (2)	26,116	24,898	23,104	...	...	178,300	233,723	258,428	298,000	397,872	430,704	...	...
United States (2) .	40,892	39,514	36,467	103.0	111.6	465,000	367,361	328,463	775,000	612,268	547,427	126.7	141.6
Mexico	18,977	21,008	20,934	80.8	80.9	65,400	150,697	164,818	109,000	251,162	274,637	43.4	30.7
Total North Amer. (2)	1,424	1,216	1,261	117.1	113.0	9,487	6,868	6,456	15,778	11,446	10,760	137.8	146.6
China Manchuria .	35,209	36,634	31,816	98.4	94.8	718,667	763,649	758,163	1,197,778	1,272,743	1,263,678	94.1	94.8
China	3,920	3,413	2,731	114.8	143.5	35,037	30,515	27,101	58,394	50,857	45,167	114.8	129.3
*Korea . . . . .	...	848	890	...	...	5,370	5,391	5,605	8,951	8,985	9,942	99.8	95.8
India	32,181	31,654	31,475	101.7	102.2	208,365	234,506	191,654	347,275	390,843	319,424	88.9	108.7
Japan	1,231	1,198	1,174	102.7	104.0	18,536	17,723	17,817	30,892	29,538	29,695	104.6	104.0
Syria and Lebanon .	1,168	1,166	1,147	100.1	101.8	3,363	11,133	7,435	13,937	18,555	12,362	75.1	112.5
Total Asia	38,500	37,431	36,527	102.8	105.4	270,300	293,377	244,007	450,458	459,793	406,678	92.0	110.8
Algeria	3,535	3,880	3,654	88.3	96.8	17,747	19,350	17,790	29,578	32,249	29,649	91.7	99.8
*Cyrenaica	18	38	33	46.2	53.2	...	93	119	...	155	198	...	...
Egypt	1,649	1,522	1,554	103.4	106.1	27,643	23,852	24,030	46,071	39,753	40,049	115.9	115.0
*Eritrea	22	...	27	...	82.4	110	...	61	184	...	101	...	181.8
Kenya (3)	60	71	57	85.3	103.3	340	389	353	567	648	597	87.5	94.9
French Morocco .	2,732	2,957	2,832	92.4	103.8	20,825	12,782	16,553	34,708	21,302	27,585	162.9	125.5
Tripolitania	17	12	34	140.0	50.7	46	11	64	77	18	107	420.0	71.9
Tunis	1,927	1,923	1,719	100.3	112.1	8,378	6,239	7,063	13,962	10,398	11,780	134.3	118.5
Total Africa . . .	9,920	10,465	9,650	94.3	102.8	74,979	62,623	65,863	124,963	104,368	109,779	119.7	113.8
*Argentina (4) . .	17,295	21,233	20,434	81.3	84.4	...	141,578	145,819	...	235,958	243,026	...	...
*Chile	1,426	1,610	1,602	33.6	89.0	...	12,714	17,255	...	21,190	25,180	...	...
*Uruguay	1,154	864	1,056	133.4	109.3	...	4,331	7,335	...	7,218	12,224	...	...
Australia	13,990	13,212	12,797	76.3	109.3	102,000	127,959	81,605	170,000	213,266	138,006	79.7	125.6
*New Zealand . . .	276	243	227	113.6	121.8	...	3,900	4,582	...	6,500	7,637	...	...
Grand Totals . . .	219,384	223,690	208,395	98.0	105.0	1,967,477	2,046,708	1,933,362	3,312,432	3,411,150	3,232,114	97.1	102.5
RYE													
Germany	10,780	11,642	11,614	92.7	92.9	147,269	169,297	167,462	262,932	302,317	299,040	87.0	87.9
Austria	904	927	948	97.5	95.5	10,260	11,556	11,257	13,322	20,636	20,102	88.8	91.1
Belgium	553	574	568	96.3	97.3	11,335	10,433	12,206	21,135	18,330	21,797	118.4	97.0
Bulgaria	597	657	481	90.3	124.3	6,760	7,087	4,104	12,072	12,620	7,399	96.7	164.7
*Denmark	330	369	448	89.6	73.8	...	5,614	6,940	...	10,026	11,337	...	...
Spain	1,544	1,551	1,717	99.5	89.9	10,367	12,064	13,554	13,512	21,544	23,847	85.9	77.6
Estonia	356	367	354	97.0	100.4	3,168	4,975	3,325	6,667	8,835	5,937	63.7	96.3
Finland	554	556	565	99.6	98.0	6,604	7,898	7,013	11,792	14,104	12,522	89.6	94.2
France	1,775	1,878	1,953	91.5	90.9	17,363	16,883	19,963	31,013	23,255	35,643	106.0	87.0
*Engl. and Wales .	33	32	28	103.6	115.4	...	470	439	...	840	785	...	...

COUNTRIES	(*) AREA					(†) PRODUCTION							
	1931	1930	Average 1925 to 1929	% 1931 1931/32	1931	1930	Average 1925 to 1929	1931	1930	Average 1925 to 1929	% 1931 1931/32	1931	
	—	—	—	—	—	—	—	—	—	—	—	—	
	1931/32	1930/31	1925/26 to 1929/30	1930/ 1931 = 100	Aver.	1931/32	1930/31	1925/26 to 1929/30	1931/32	1930/31	1925/26 to 1929/30	1930/ 1931 = 100	Aver.
	1,000 acres					1,000 centals			1,000 bushels				
*Greece	...	163	121			1,016	1,043	868	1,815	1,866	1,549	97.3	117.1
Hungary	1,530	1,611	1,649	95.0	92.8	12,081	15,907	16,836	21,574	23,406	30,064	75.9	71.8
Italy	238	302	307	95.4	93.7	3,469	3,431	3,649	6,195	6,127	6,516	101.1	95.1
Latvia	571	660	627	86.6	91.0	3,133	8,051	5,223	5,595	14,377	9,335	38.9	59.9
Lithuania	1,280	1,197	1,192	106.9	107.3	9,028	14,099	11,412	16,121	25,177	20,379	64.0	79.1
Luxemburg	16	22	17	73.7	96.3	171	269	206	306	480	367	63.8	83.3
Norway	15	19	21	79.9	72.5	301	311	325	538	556	580	96.8	92.7
Netherlands . . .	444	475	489	93.3	90.8	7,350	8,340	8,866	13,125	14,892	15,832	88.1	82.9
Poland	13,312	14,567	14,016	91.4	95.0	119,932	153,399	136,378	214,165	273,028	243,534	78.2	87.9
Rumania	1,063	968	720	109.8	147.7	8,819	10,241	5,971	15,747	18,288	10,662	86.1	147.7
Sweden	510	595	741	85.6	68.8	6,834	10,083	10,981	12,204	18,005	19,609	67.8	62.2
Switzerland	46	49	49	92.5	93.5	800	831	912	1,429	1,484	1,629	96.3	87.7
Czechoslovakia . .	2,493	2,509	2,535	95.9	98.4	23,279	39,409	37,015	50,498	70,374	63,099	71.8	70.4
Yugoslavia,	623	626	531	99.6	117.4	4,548	4,382	4,148	8,121	7,825	7,407	103.8	109.6
Total Europe . . .	39,293	41,342	41,092	93.8	95.5	418,376	508,426	480,611	747,103	907,010	858,235	82.3	87.0
*U. S. S. R.	70,086	72,233	66,620	97.0	105.2	...	..	489,038	...	...	873,285	...	...
Canada	778	1,448	794	83.7	97.0	3,297	12,330	7,345	5,888	22,018	12,937	26.7	45.5
United States . . .	3,294	3,525	3,601	93.4	91.5	20,272	26,963	25,832	36,200	45,149	46,129	75.2	78.5
Total North Amer. .	4,072	4,973	4,395	81.9	92.7	23,569	39,293	33,077	42,088	70,167	59,066	60.0	71.3
*Argentina (4) . . .	1,378	1,322	901	104.3	153.0	...	2,646	3,352	...	4,724	5,986	...	...
*Chili	7	8	7	83.7	95.2	...	67	66	...	120	118	...	...
Grand Totals . . .	43,333	46,815	45,487	92.6	95.3	441,945	547,719	513,688	789,191	978,077	917,301	89.7	86.0

BARLEY

Germany	4,001	3,753	3,692	106.6	108.4	66,540	63,058	63,172	133,622	131,373	131,611	105.5	105.3
Austria	422	430	371	98.1	113.8	5,119	5,893	5,237	10,665	12,278	10,911	86.9	97.7
Belgium	70	84	77	83.2	91.3	1,630	1,636	1,694	3,396	3,985	3,947	88.8	86.1
Bulgaria	607	602	562	87.7	108.0	7,949	9,537	5,858	16,560	19,669	12,204	83.3	135.7
*Denmark	887	923	936	95.5	107.3	...	23,170	19,940	...	43,272	41,542	...	...
Spain	4,465	4,543	4,436	98.3	100.2	43,261	49,883	44,786	90,129	103,026	93,305	88.7	96.6
Estonia	279	276	285	100.9	98.0	2,705	2,829	2,454	5,636	5,863	5,112	95.6	110.3
*Irish Free State	115	116	131	99.0	87.9	...	2,648	3,001	...	5,517	6,253	...	...
Finland	276	272	271	101.4	101.7	3,086	2,937	3,086	6,480	6,223	6,429	103.8	100.0
France	1,960	1,836	1,776	106.8	110.3	26,397	21,761	24,356	54,807	45,336	50,742	120.9	108.0
Engl. and Wales	1,023	1,020	1,164	100.9	83.4	17,069	16,503	21,524	36,580	34,332	44,843	103.4	79.3
*Scotland	92	107	121	86.3	76.0	...	2,128	2,433	...	4,483	5,068	...	...
*N. Ireland	1	2	2	68.4	77.9	...	48	40	...	99	84	...	...
*Greece	...	529	453	...	...	4,403	3,923	3,249	9,172	8,173	7,768	112.2	135.5
Hungary	1,188	1,181	1,054	104.8	112.5	10,249	13,250	13,118	21,353	27,605	27,330	77.4	78.1
Italy	530	583	577	90.8	91.8	5,289	5,377	5,416	11,020	11,202	11,285	98.4	97.7
Latvia	453	437	436	103.6	104.0	4,431	4,130	4,232	9,232	8,605	7,128	107.3	123.6
Lithuania	493	529	494	93.2	99.7	5,344	5,224	4,831	11,133	10,384	10,065	102.3	110.6
Luxemburg	9	7	8	116.1	101.9	107	99	112	224	206	233	108.7	95.9
Malta (5)	7	7	6	101.4	106.0	137	142	138	235	295	288	96.8	99.0
Norway	138	134	143	102.8	97.1	2,257	2,362	2,362	4,703	4,922	4,928	95.6	95.4
Netherlands	70	76	71	92.8	99.3	1,764	1,989	1,616	3,674	4,040	3,992	91.0	92.0
Poland	3,111	3,048	2,841	101.1	109.5	33,290	32,274	30,767	69,355	67,238	64,099	103.1	108.2
Rumania	4,769	4,881	4,360	97.7	109.4	33,731	52,279	36,233	70,274	108,916	75,487	64.5	93.1
Sweden	313	326	348	96.0	90.0	4,828	5,290	5,719	10,069	11,021	11,913	91.3	84.4
Switzerland	18	16	16	102.2	110.1	295	238	237	615	496	559	124.1	110.7
Czechoslovakia	1,759	1,873	1,766	105.1	99.6	21,813	23,545	22,597	45,440	55,994	59,379	81.2	76.3
Yugoslavia	1,179	1,133	976	97.6	113.3	8,184	8,615	8,342	17,051	18,574	17,379	91.8	98.1
Total Europe	27,144	26,887	25,769	100.9	105.4	305,335	332,634	313,609	636,235	693,043	653,363	91.3	97.4
*U. S. S. R.	17,070	18,417	17,724	92.7	96.3	...	...	124,687	...	...	299,770	...	...
Canada	3,765	5,559	4,237	67.7	87.6	32,627	64,877	50,138	67,972	135,190	104,550	50.3	65.0
United States	12,771	12,901	10,222	96.0	124.9	108,630	160,786	127,201	216,000	334,971	265,000	64.5	81.5
Total North Amer.	16,536	18,460	14,459	92.6	113.9	136,307	225,663	177,338	283,972	470,131	369,556	60.4	76.8
*Korea	2,832	2,209	...	...	...	19,621	19,127	17,866	40,877	39,849	36,805	102.6	111.1
Japan	2,106	2,110	2,333	99.8	90.1	26,730	34,786	40,696	76,522	72,472	84,785	105.6	90.3
Sri Lanka and Ceylon	941	881	706	113.3	133.4	6,658	10,563	6,746	12,871	22,621	14,066	61.3	96.7
Total Asia	3,846	3,941	3,043	103.6	109.2	43,238	65,444	47,462	96,393	95,093	98,846	95.1	97.5

COUNTRIES	(†) AREA					(†) PRODUCTION							
	1931	1930	Average 1925 to 1929	% 1931 1930/31	% 1931 1931/32	1931	1930	Average 1925 to 1929	1931	1930	Average 1925 to 1929	% 1931 1930/31	% 1931 1931/32
	—	—	—	—	—	—	—	—	—	—	—	—	—
	1931/32	1930/31	1925/26 to 1929/30	1930/31 = 100	Aver. 1931 = 100	1931/32	1930/31	1925/26 to 1929/30	1931/32	1930/31	1925/26 to 1929/30	1930/31 = 100	Aver. 1931 = 100
	1,000 acres					1,000 centals			1,000 bushels				
Algeria	3,199	3,650	3,445	87.6	92.8	14,881	18,327	16,661	31,003	38,183	34,712	81.2	89.3
*Cyrenaica	82	127	133	64.5	61.3	—	276	772	—	574	1,609	—	—
Egypt	306	345	368	88.7	89.0	4,653	5,043	5,440	9,693	10,506	11,334	92.8	85.5
*Entrea	62	—	58	—	105.9	320	—	168	666	—	346	—	192.3
French Morocco	3,156	3,207	3,028	98.4	104.2	24,643	17,995	21,933	51,341	37,491	45,695	126.9	112.4
Tripolitania	99	124	274	50.0	36.0	265	165	609	551	344	1,268	160.0	43.5
Tunis	1,087	1,202	1,243	90.4	87.5	3,963	2,646	4,105	8,268	5,512	8,741	150.0	94.6
Total Africa	7,547	8,325	8,338	92.0	93.9	48,410	44,176	45,838	100,376	92,036	101,750	109.6	99.1
*Argentina (4)	1,430	1,422	1,171	101.2	122.8	—	6,834	7,961	—	14,238	16,587	—	—
*Chili	144	166	173	86.9	89.4	—	1,860	2,681	—	3,876	5,585	—	—
*Uruguay	12	15	8	78.0	147.2	—	132	64	—	276	133	—	—
*New Zealand	24	25	23	95.0	102.6	—	397	458	—	828	953	—	—
Grand Totals	54,573	56,816	51,069	96.0	105.6	533,490	648,131	587,223	1,111,456	1,350,303	1,223,514	82.3	90.8
OATS													
Germany	8,309	8,499	8,640	97.8	96.2	136,705	124,702	143,893	427,482	389,690	449,664	109.7	95.1
Austria	720	772	757	93.3	95.2	7,346	8,834	9,591	22,956	27,006	29,972	83.2	76.6
Belgium	723	674	678	107.9	107.3	12,986	12,231	15,318	40,581	38,223	47,689	106.2	84.8
Bulgaria	205	345	338	83.6	87.4	2,754	2,437	2,382	8,605	7,616	7,267	113.0	118.1
*Denmark	935	958	1,028	97.7	91.0	—	21,692	21,201	—	68,725	66,254	—	—
Spain	1,603	1,940	1,873	87.3	90.4	13,562	15,999	12,913	42,380	49,985	40,854	84.8	105.0
Estonia	367	368	337	99.6	102.7	3,431	3,478	2,670	10,723	10,570	8,848	98.6	128.5
*Irish Free State	628	644	656	97.5	95.8	—	14,160	14,419	—	44,250	45,060	—	—
Finland	1,149	1,137	1,110	101.1	103.5	14,684	13,267	12,933	45,886	41,458	40,415	110.7	113.5
France	8,633	8,557	8,598	100.9	100.5	110,132	96,830	111,902	344,222	302,749	349,690	113.7	98.4
Engl. and Wales	1,652	1,778	1,820	92.9	90.8	27,754	30,036	32,202	86,730	93,863	100,632	92.4	86.2
*Scotland	846	862	806	98.2	93.4	—	14,493	15,882	—	45,290	49,630	—	—
*N Ireland	236	307	315	93.1	90.8	—	6,209	6,297	—	19,408	19,678	—	—
*Greece	—	359	262	—	—	2,116	1,917	1,568	6,614	5,991	4,900	110.4	135.0
Hungary	612	608	687	100.7	89.1	4,043	5,760	8,235	12,685	17,999	25,734	70.2	49.1
Italy	1,222	1,262	1,243	96.9	98.3	13,331	11,765	13,793	41,658	36,828	43,103	113.1	96.6
Latvia	795	790	740	100.6	107.5	7,832	7,532	5,480	24,681	23,537	17,124	104.6	143.8
Lithuania	934	855	823	109.2	112.8	9,417	8,599	6,546	29,427	26,871	21,894	109.5	137.5
Luxemburg	70	70	72	100.0	97.6	880	880	971	2,749	2,750	3,035	100.0	90.6
Norway	237	239	241	99.0	98.2	3,339	4,359	4,024	10,433	13,621	12,574	76.6	83.0
Netherlands	868	370	377	99.0	97.1	6,067	6,545	7,832	18,960	20,454	22,913	92.7	82.7
Poland	5,465	5,404	5,007	101.1	109.1	55,116	51,756	51,251	172,235	161,738	160,169	106.5	107.5
Rumania	2,422	2,686	2,806	90.2	86.3	17,858	25,407	22,518	55,804	70,679	70,368	70.0	70.3
Sweden	1,589	1,629	1,763	97.5	90.1	21,539	25,299	26,111	67,310	70,058	81,585	85.1	82.5
Switzerland	45	48	50	93.9	90.6	851	851	928	2,859	2,859	2,900	100.0	91.7
Czechoslovakia	2,116	2,049	2,073	103.3	101.9	26,526	28,833	30,967	82,893	90,101	96,385	92.0	85.6
Yugoslavia	979	1,037	936	94.4	104.8	8,111	6,283	7,548	10,068	10,634	23,556	67.3	81.6
Total Europe	40,403	41,117	40,899	98.2	98.6	502,424	491,543	529,785	1,570,067	1,536,999	1,655,576	102.2	94.3
*U. S. S. R.	42,497	44,287	41,262	96.0	103.0	—	—	326,462	—	—	1,020,185	—	—
Canada	12,819	13,259	12,831	96.7	90.9	112,623	143,870	133,306	351,946	440,595	416,583	78.3	84.5
United States	41,248	40,125	42,554	102.8	96.9	375,080	434,577	421,428	1,174,000	1,353,052	1,310,863	86.4	89.1
Total North Amer.	54,067	53,384	55,385	101.3	97.6	488,303	578,447	554,734	1,525,946	1,807,647	1,723,535	84.4	88.0
Syria and Lebanon	27	28	41	96.5	66.8	204	175	282	639	547	580	116.8	72.6
Algeria	542	638	605	84.9	89.6	3,483	5,300	4,118	10,885	16,561	12,866	85.7	84.6
French Morocco	73	103	71	71.6	103.9	735	754	559	2,359	2,857	1,747	100.1	135.0
Tunis	99	124	104	79.6	94.7	1,086	661	825	3,288	2,067	2,577	156.7	125.7
Total Africa	714	865	780	82.6	91.6	5,274	6,715	5,502	16,482	20,365	17,195	78.5	95.3
*Argentina (4)	3,470	3,387	3,387	83.1	102.6	—	15,873	21,278	—	49,604	66,490	—	—
*Chili	156	183	193	81.0	80.9	—	1,635	2,199	—	5,109	6,870	—	—
*Uruguay	214	179	150	119.5	142.7	—	1,101	869	—	3,440	2,716	—	—
*New Zealand	329	322	320	102.2	102.9	—	1,381	1,485	—	4,314	4,639	—	—
Grand Totals	95,211	95,394	97,265	99.8	98.0	996,265	1,077,189	1,090,368	3,113,124	3,566,178	3,467,185	92.5	94.4

(†) The two dates mentioned refer to the years in which the harvest took place in the northern and southern hemispheres respectively. —
 * Countries not included in the totals. — (s) Autumn crops. — (2) Spring crops. — (x) Including spelt and meslin. — (a) Increase over October estimate due to use of decennial census figures instead of the survey estimates used previously; the percentages are not given. —
 (3) European crops only. — (4) Area sown. — (5) Barley and meslin.

of late sown cereals have sprouted slowly due to the dry weather which has set in ; their further development has been hindered considerably by night frosts. On November 1 the crop condition of winter cereals was : winter wheat : 2.6 (against 2.2 on November 1, 1930) ; winter rye : 2.5 (2.2) and winter barley : 2.5 (2.3).

Belgium : Save for some rainy days the weather has been fine and sunny , toward the end of October there were some night frosts but in general weather conditions were very favourable. Sowings were carried out under excellent conditions, the crops have sprouted regularly and are vigorous. Though the value of selected seeds is greatly appreciated their purchase is limited by the critical situation of agriculture.

Bulgaria : October weather favoured sowings.

Spain : Winter cereal sowings were effected under rather poor conditions as the autumn rains were late and the soil, due to the persistent drought, was not in good working condition.

Estonia : Production this year is 1,974,000 centals (3,403,000 bushels) an increase of 6.9 % on that of last year (1,846,000 centals ; 3,182,000 bushels) and an increase of 38.1 % on the average of the five years ending 1929, 1,429,000 centals (2,464,000 bushels).

Irish Free State : October was continuously dry and genial except for a few nights in the third week when there were sharp frosts. The harvest was completed under ideal conditions and crops were stacked and threshed in dry condition. No damage was reported from pests or diseases. The early clearance of crops off the land facilitated preparations for sowing of winter wheat. Some sowings were made under excellent conditions, both as regards soil and weather.

France : Autumn has this year been more favourable to crops than has summer, but the prolongation of the drought that began to be felt toward 15 October in almost all regions caused anxiety to growers and there were very serious complaints. Some moisture had become indispensable for germination and for cultivation and further sowings. Various districts had even partly suspended these last. Nevertheless, there has for the first time in recent years been on the whole no delay of the main operations. These operations are so far advanced that in many *départements* where small subdivided holdings predominate they were almost finished toward 20 October and threshings had already been recommenced. Naturally this was far from being the case on middle-sized holdings and still less so on large holdings, especially as temperature was greatly lowered and more or less heavy frosts occurred here and there. Happily very opportune rains fell on 23 and 24 October in the majority of regions north of the Loire, favouring germination of the young sowings, which are, in general, in very encouraging condition. However, toward the end of the month there was need of rain in the northern regions similar to that which had just fallen in the South and southeast, regions where the drought was already over. At the beginning of November large areas were sown and preparation of the land was making rapid progress ; the weather was very mild, with very few occurrences of hoar-frost, which facilitated the struggle against insects, but there was much need of some showers, the soil having hardened and become difficult to work and vegetation having need of stimulation before the coming of the bad weather ; sprouting had taken place perfectly and the condition of the sowings was generally

satisfactory. Work in general was well in advance of last year in many regions ; many parts of Beauce, of the Centre and of the East had finished sowings and recommenced threshings.

Toward 1 November temperature was somewhat higher and rains fell more or less plentifully according to the district, though with fairly prolonged respites enabling the ground to absorb the moisture well. There are no floods reported and work was pursued normally. Cultivation was greatly facilitated and moisture, accompanied by fairly mild temperatures, stimulated sowings, the appearance of which is very encouraging. Threshings continued in numerous regions where seasonal operations had already terminated. It is very probable that the area of autumn wheat will be considerably above that of last year.

The approximate results of the cereal crops in 1931 appeared in the *Journal Officiel* of 11 November and will be found in the different cereal tables of the Crop Report. As regards wheat, grouping of the results of the four northern regions (North, East, West and Centre) and those of the four southern regions (East-Central, South-West, Central Plateau and South) into which France is divided and their comparison with the corresponding results of 1930 shows that in the first group the area has diminished by 7 % while production has increased by 6 %, while in the second group the area is only 3 % below that of 1930 and production has increased by 51 %. The average yield of the group of northern regions has risen from 12.3 centals (20.5 bushels) per acre in 1930 to 14.0 (23.3) ; that of the second group from 7.0 (11.7) to 11.0 (18.3). The general average is 12.9 (21.6) against 10.5 (17.5) in 1930.

The area sown to mixed cereals this year was 174,100 against 199,400 in 1930 and 205,200, the average of 1925-29 ; percentages 87.3 and 84.8. Production is 1,908,200 centals (3,297,000 bushels) against 1,910,800 (3,294,500) in 1930 and the average of 2,294,000 (3,960,400) ; percentages 99.9 and 83.1.

Great Britain and Northern Ireland : There was very little rain in October save at the end of the month in Northern Ireland ; while temperatures were on the whole mild, sharp night frosts were reported from England and Wales and from Northern Ireland. Preparations for autumn and winter sowing, which had been delayed by the late harvest, were favoured and both ploughing and manuring were well forward at the end of the month. In Northern Ireland harvesting of spring cereals was practically completed.

Italy : In the first two decades of October dry weather prevailed ; in the third decade there was abundant rain in Northern and Central Italy and infrequent showers in the South and the Islands. Wheat sowings, which were late in the first half of the month, made good progress in the latter half. The first sowings are developing regularly.

Hungary : During the three weeks from October 7 th. to 30th. the mild weather, usual at this time of the year predominated. At the same time there was a shortage of precipitation over most of the country. At the end of October sowing operations approached completion. All the winter cereals sprouted uniformly and made good progress. Rye particularly showed vigorous development.

Latvia : During October temperatures fell slowly ; during the first three weeks it was still warm and the temperature dropped below zero only on October 6. Precipitation was normal during the whole of the month ; towards the end of the month the first snow fell but lasted for only one day.

Lithuania : In the first half of November weather conditions were favourable for field work which was effected under average conditions ; in some regions, however, winter rye sowings are backward.

Luxembourg : Weather in October was favourable to preparatory work for sowings, which were carried out in generally good conditions.

Rumania : The lack of precipitation in the first half of October generally hindered winter sowings. In the latter half of the month there were only some regions of Moldavia and Bessarabia where precipitation was insufficient, the rains having generally allowed sowing to be intensified. According to the official estimate, the area sown to winter cereals up to the end of October, a date to which operations continued actively, is 25 % smaller than the area sown last autumn.

Yugoslavia : Weather in October was variable ; in the first two decades dry and sunny but cold days prevailed and in the last decade warm, rainy weather. On the whole sowings were favoured and growth was active

U. R. R. S. : According to the data of the Commissariat for Agriculture the harvest had been effected on 96 % of the area sown. Numerical data of production are not yet available. According to declarations of the President of the Council of People's Commissars at the beginning of November at the all-Union anti-drought conference, 1931 has been a year of drought in a certain number of vast producing regions in the south-east of the Union. Several million hectares have suffered and the losses of cereals are estimated at some hundreds of millions of puds. However, the total harvest of the current year is not below that of last year. On 5 November the area sown to winter cereals was 91,841,000 acres, i. e., 86.4 % of the figure planned and 91.8 % of the area sown last autumn. Preparatory work for spring cereals was effected on the same date on 73,171,000 acres, i. e., 70.5 % of the area planned. Acquisitions of cereals by State and cooperative organisations from the beginning of the season to 25 October attained 54.3 % of the total planned for the season ; acquisition from 1 October to 25 October represent only 39.4 % of those planned for this period.

Argentina : The third estimates of area sown to cereals are substantially the same as those published in the last Crop Report, showing, however, a slight increase for wheat and rye and a slight decrease for oats and barley. It is interesting to note that a large part of the reduction of area sown to wheat this year, which is about 20 % of last years' area, has been made in the Pampas and in the poorest areas of the Provinces of Buenos Ayres and Cordoba adjacent to the Pampas, where yields are generally low. At the middle of October, prospects for cereals in the whole of the Republic were good, thanks to the favourable weather conditions since sowing time. In the South of the Province of Buenos Ayres growth was a little backward, whereas in the North heading had already begun. In the Provinces of Cordoba and Santa Fé, some wheat areas were attacked by rust. While the latter generally causes little damage, suitable measures were taken to check it from spreading. In the other Provinces, crop condition was also good and satisfactory yields were anticipated. Only in the Pampas area was a large part of the first sowings destroyed by strong winds in August and September. Late sowings, however, developed satisfactorily and although their growth was rather delayed by cold, they promised to yield well. Only limited damage was caused by locusts except in the North of the Province of Santa Fé where

somewhat larger harm was done. According to information received by telegram of November 17, crop condition of cereals on the whole has remained fairly good, although in some places slight damage has been caused by storms, frosts, hail, rust and excessive rain. In the north of Santa Fé harvesting was in full swing. In the province of Entre Rios crop condition of wheat was very varied. On the Pampa 50 % of the crop was lost owing to severe frosts in the first half of November. The recently more favourable situation on the world market has encouraged farmers and is reflected in the improved credit conditions and the movement of business transactions. Since nearly all costs have fallen, farmers in the producing areas more distant from the ports have requested the railways through the Ministry of Agriculture, to grant reduction of freights for the coming season.

Canada : The new estimate of wheat production published this month, (178,800,000 centals or 298,000,000 bushels) shows a large increase over that of October (162,840,000 centals or 271,400,000 bushels). This variation is due to the use of the decennial census figures instead of the survey estimates used previously. Most of the increase is recorded in the northern regions of Alberta and Saskatchewan where the crop was late and where wet harvesting weather resulted in much damp and tough wheat, considerable quantities of which will probably be fed to livestock. Threshing is now practically complete over the whole of the country. For all Canada, the proportion of land intended for next year's crops that has been ploughed up to October 31, is estimated at 46 % compared with 36 % at the corresponding date of 1930. The areas to be sown to winter wheat and rye this year for harvest in 1932 compared with the final figures for the areas sown in 1930 for the crop of 1931, and the average for the preceding five seasons, are as follows (the years given in the heading are those in which the crop is harvested) :

	1932	1931	Average 1926-1930	% 1932	
				1931 = 100	Average = 100
	—	—	—	—	—
	(thousand acres)				
Winter wheat	560	894	983	62.6	56.9
Winter rye	599	944	731	63.5	81.9

Crop conditions on November 1, 1931 and November 1, 1930 were respectively as follows : winter wheat : 105 (92) ; winter rye : 94 (90).

United States : The quality of winter wheat on November 1 was estimated at 92.1 compared with 93.4 at the same date of 1930 and 89.7 on the average for the period 1920-1929. Corresponding figures for the other cereals are : spring wheat (durum) 83.8, 87.7, 90.5 ; spring wheat (other) : 82.7, 86.5, 87.2 ; oats : 79.8, 91.2, 86.1 ; barley : 77.9, 86.5, 87.2 ; rye : 83.0, 86.7, 89.6.

In the week ended on November 6 progress and condition of the winter wheat crop varied from good to excellent in central and eastern portions. Conditions were still too dry in western Kansas where the crop was poor to fair and hampered by lack of soil moisture, with some not yet up. Dry conditions were relieved in Kentucky and Tennessee but in the South and Southeast the drought continued unabated, with hard soil and only slow advance of seeding generally. Additional moisture was helpful in the Pacific Northwest but general rains were needed. Winter grains improved in Oklahoma and parts of Texas but in the central and southern parts of the latter State the

soil was still too dry and germination poor. On November 12 the crop condition of winter wheat remained unchanged. According to a telegram dated November 18th., received from the U. S. Department of Agriculture, rainfall has been general during the last week throughout the winter wheat belt except in western and southern sections

In the principal producing areas the work of preparing the soil has been effected under good conditions. It is forecast that the area sown this year will be smaller than that of last year due to the low price obtained for this cereal on the world market.

Uruguay : Sowings of winter cereals were made under excellent conditions. Weather has been exceptionally favourable since preparation of the soil was begun. The crops have made great progress and a good harvest is expected.

Palestine : Sowings of afir wheat are over in all districts where this method is practiced. Weather has been normal. Work has been carried out in average conditions.

Algeria : Cultivation following the rains at the end of September was rendered increasingly difficult by the ensuing drought but the copious rains in the last days of October have stimulated sowings, of which a part has been made on dry lands

French Morocco : Preparatory work was effected under good conditions. Rains fell in abundance toward the end of October. Sowings have just begun. It is expected that on the whole the area sown will be larger than that of last year.

Tunisia : In the north of the Regency weather has been favourable ; yields have been above average save in a few localities where they were reduced by excessive moisture, rust and cecidomya. In the centre and south production has been very poor or nil, due to the persistent drought. Autumn sowings, begun under good conditions after the rains of the first days of October, were interrupted in the latter half of the month by the drought. In the north the rains of September have encouraged weeds, which were destroyed in October, however, by new ploughing.

Union of South Africa : September was generally very dry and the benefits of the winter precipitation were largely dissipated by a spell of warmth accompanied by drying winds. Cold winds at the beginning of September caused a certain amount of damage to wheat in the inland areas. Despite these unfavourable conditions, however, the general condition of wheat is high and a large production for the Union is practically assured. In the Cape south-western districts conditions have been particularly favourable during the past winter. Heavy yields are expected and very little rust damage has been reported.

Australia. (Telegram of 16 November) : In Western Australia during the early part of the month the weather was generally favourable to wheat, which is looking healthy, a fairly good yield being expected. In New South Wales the weather was unfavourable but crop condition is fairly satisfactory. In South Australia and Victoria also the weather has been generally unfavourable and rains are wanted to improve prospects.

MAIZE

With the new data received by the Institute after the publication of the October Crop Report, crop results are now known for about 95 % of European production. The only estimates still lacking are those for France, Greece, Poland and Portugal and for Italy, that of quick ripening maize ("cinquantino"); the total production of these countries was 29 million centals (51 million bushels) in 1930 and 24 million centals (43 million bushels) on the average for the five-year period 1925-1929.

Maize.

COUNTRIES	AREA				PRODUCTION								
	1931	1930	Average 1925 to 1929	% 1931 1930 = 100	1931	1930	Average 1925 to 1929	1931	1930	Average 1925 to 1929	% 1931 1930 = 100	Average 1925 to 1929	
1,000 acres				1,000 centals			1,000 bushels of 56 lbs						
Austria . . .	148	143	146	103.9	101.7	3,314	2,663	2,490	5,917	4,756	4,447	124.4	133.1
Bulgaria . . .	1,676	1,639	1,671	99.2	100.3	21,983	17,088	14,713	39,256	30,515	26,274	128.6	149.4
Spain	1,115	1,106	1,057	100.9	103.5	13,119	16,152	13,144	23,428	23,844	23,471	81.2	99.8
Hungary . . .	2,735	2,605	2,662	103.0	102.8	32,258	31,021	39,546	57,605	55,394	70,618	104.0	81.6
Italy . . . (s)	3,423	3,486	3,541	98.2	96.6	40,643	63,131	51,754	72,578	112,735	92,418	64.4	78.5
" " " (s)	235	255	218	92.2	107.8	...	2,899	2,013	...	5,176	3,595	...	...
Rumania . . .	11,486	10,939	10,606	105.0	108.3	132,278	99,643	99,979	236,211	177,942	178,534	132.7	132.3
Switzerland . .	3	3	3	79.2	76.4	66	64	84	118	114	150	103.4	78.5
Czechoslov. . .	368	364	344	101.2	107.0	4,899	5,479	5,363	8,748	9,783	9,577	89.4	91.3
Yugoslavia . .	6,158	6,097	5,575	101.0	110.5	70,945	76,381	67,356	126,688	136,395	120,279	92.9	105.3
—													
*U. S. S. R. . .	9,742	9,684	8,386	100.6	116.2	...	...	79,114	...	...	141,275	...	...
—													
Canada	139	161	174	86.3	79.8	3,160	3,263	3,703	5,643	5,826	6,613	96.9	85.3
United States .	105,557	101,413	99,570	104.1	106.0	1,497,440	1,172,389	1,546,016	2,674,000	2,093,552	2,760,751	127.7	96.9
China:													
Manchuria . .	2,441	2,139	2,469	114.1	98.9	37,754	35,030	37,848	67,418	62,554	67,536	107.8	99.8
Syria and Leb. .	67	61	121	109.7	56.2	534	600	1,370	1,043	1,071	2,446	97.4	42.6
—													
Algeria	20	24	25	81.5	79.7	118	164	144	211	292	257	72.1	82.1
Entrea	22	22	13	100.0	166.7	132	198	79	236	354	142	66.7	166.7
Kenya (1) . . .	193	206	201	96.4	99.1	2,105	3,299	2,475	3,760	5,892	4,420	63.8	86.1
Fr. Morocco . .	837	649	561	129.0	149.3	2,090	3,354	2,973	3,715	5,960	5,309	62.0	70.0
It. Somaliland .	14	40	39	35.3	36.4	150	530	426	269	946	760	23.4	35.4
Tunis (2) . . .	44	37	45	119.0	99.2	110	132	108	197	236	192	83.3	102.5
Grand Total . .	136,452	131,184	123,823	104.0	105.9	1,863,138	1,536,586	1,869,571	3,327,041	2,733,191	3,374,244	121.7	98.6

* Countries not included in the totals. — s) Late crop (« maggengo »). — f) Early crop (« cinquantino »). — 1) European crop. — 2) Maize and sorghum.

On the basis of information on weather conditions in the above mentioned countries during the growing period of maize, it may be considered probable that their production this year will not exceed 24 million centals (43 million bushels).

Adding this figure to the total production of the nine European countries indicated in the following table which amounts to 320 million centals or 571 million bushels (against 311 million centals or 555 million bushels in 1930 and 295 million centals or 528 million bushels on the average for 1925-1929), the total European maize production may be calculated at about 344 million centals (614 million bushels) against 340 (606) in 1930 and 320 (571) on the average for 1925-1929.

The most recent estimate of production of maize in the United States shows a further slight reduction on the preceding figure so that this year's crop is 3.1 % smaller than the average for 1925-1929.

While the data already known furnish the world market with a fairly exact knowledge of the quantity produced in the northern hemisphere, the attention of the market is turning with growing interest to the news concerning the maize crop in Argentina. The area sown and weather conditions in the latter country will, in the coming months constitute a fundamental factor in the formation of prices. The official data of area sown to maize in Argentina are not usually published before the beginning of February but private information has indicated an increase in the crop and it is known that sowings have been effected under very favourable conditions.

V. DE.

* * *

Austria : At the end of October harvesting of maize was completed. The cobs are generally well ripe and yields are satisfactory. On November 1 crop condition was 2.6 against 2.5 on October 1 this year and on November 1, 1930.

Spain : The deficient production of maize is due to drought in central and southern areas and to excessive rain in the northern area of the country.

Hungary : At the end of October harvesting of maize was completely finished and cutting of the stalks was begun.

Rumania : In the first half of October the rather dry weather favoured harvesting, which was carried out under good conditions. At the beginning of November the harvest was almost finished everywhere save in some Carpathian regions where the inclement weather and the scarcity of labour had hindered work.

Argentina : Sowings have been effected everywhere under good conditions. The weather has been particularly favourable for the work of preparing the soil and to the sowings. This year the farmers have used the best quality seed as a result of a recent Government Decree providing that the sum of 400,000 pesos which had been destined by a previous Decree for the purchase of wheat seed and flax seed to be distributed on credit among the farmers and which had been only partly used should be used for the purchase of maize seed after the deduction of 50,000 pesos for the purchase of select rice seed. The distribution was made in proportion to the areas cultivated and sown to this crop and the farmers could pay in cash or by means of a bond falling due on April 15, 1930 at a rate of interest of 6 % per annum. The Ministry of Agriculture has, as security for the bond, the crop when produced.

United States : In the week ended on November 6, harvesting of maize proceeded under very good conditions except in the upper Mississippi Valley, where cloudiness and frequent light rains delayed work most of the time. Husking was nearly completed in northwestern Iowa and was well along in the East. In the following week the weather continued generally very favourable and by November 12 harvesting was well forward. According to a telegram dated November 18th. received from the U. S. Department of Agriculture, harvesting of maize has been delayed by rains.

Mexico : Harvesting of maize was effected under good conditions and yields were estimated to be above the average.

Java and Madura : Area harvested or to be harvested in 1931, which for the Institute corresponds to the campaign 1930-31, is 4,688,000 acres, a decrease of 5.2 % on that of last year (4,946,000 acres) and an increase of 4.7 % on the average of the five years ending 1928-29 (for the Statistical Department of the Dutch East Indies : calendar year 1929) which amounted to 4,478,000 acres. Production during the same year is provisionally estimated and as far as concerns the last months, forecasted as 43,000,000 centals (76,800,000 bushels) a decrease of 2.3 % on that of last year (44,022,000 centals 78,611,000 bushels) and an increase of 5.6 % on the average of the five years ending 1928-29 (40,730,000 centals ; 72,732 000 bushels)

Palestine : In Huleh the second crop is already over.

Egypt : Thinning and manuring of late-sown areas of nili maize were over, while early sown areas were at the stage of ripening and harvesting. Cutting of some early sown areas in Lower and Upper Egypt was started. In Middle Egypt however, it was not yet begun. Ordinary cultivations were still in the cob- and grain-forming stage. Crop condition was satisfactory. On 1 November it was 100 against 98 on 1 October and 100 on 1 November 1930

Eritrea : The crops were damaged by drought and locusts.

Tunisia : Maize and sorghum have given only mediocre yields owing to the severe heat and drought of the summer.

RICE

Italy : In October harvesting, threshing and storing were completed. Yield is below normal.

Argentina : According to a recent decree a sum of 50,000 pesos has been allocated for the purchase of rice seed in Brazil for distribution on credit among farmers who will pay cash or alternatively by means of a bond to fall due on April 15, 1932 at an annual interest of 6 %. The Ministry of Agriculture will have, as security, the crop when produced.

Mexico : Crop condition is good in all producing areas. In some regions the crop is already being harvested and has given satisfactory yields.

India : Rainfall in the third week of October in Bengal was light to moderate and helped the flowering of winter paddy. In the following two weeks further rains in East and West Bengal were beneficial to crops and on November 4 prospects for winter rice were satisfactory. In Bihar and Orissa rainfall in October was heavy in some parts but insufficient in others. Condition of rice in Madras was fair at the end of October ; rains in the last week of the month were heavy in parts of the Circars and Carnatic

Rice.

COUNTRIES	AREA					PRODUCTION										
	1931/32	1930/31	Aver.	%	1931/32	1931/32	1930/31	Aver.	1931/32	1930/31	Aver.	%	1931/32			
			1925/26	1931/32				1925/26			1931/32	1925/26		1931/32	1925/26	1931/32
			to	1930/				to			1930/	to		1930/	to	1930/
			1929/30	1931				1929/30			1931	1929/30		1931	1929/30	1931
1,000 acres					1,000 centals			1,000 bushels of 45 lbs.								
Bulgaria . .	14	17	18	81.7	78.7	290	366	329	645	814	730	79.3	88.4			
Italy . .	344	361	349	95.3	98.5	14,275	14,333	14,652	31,721	31,850	32,559	99.6	97.4			
Umt. States.	958	959	950	99.9	100.5	19,350	18,595	18,394	43,000	41,322	40,876	104.1	105.2			
China: Man- churia . .	495	510	522	97.0	94.8	7,002	6,883	6,781	15,560	15,296	15,069	101.7	103.3			
Formosa (1)	677	660	615	102.7	110.1	14,477	13,892	12,208	32,164	30,871	27,178	104.2	118.6			
Korea . . .	3,963	3,970	3,885	99.8	102.0	63,438	76,746	59,472	140,971	170,543	132,158	82.7	106.7			
India . . .	77,429	74,102	73,766	104.5	105.0	1,089,870	1,048,178	997,000	2,421,886	2,329,239	2,237,000	92.3	92.6			
Japan . . .	7,952	7,938	7,787	100.2	102.1	219,386	266,446	237,020	487,514	592,091	526,700	82.3	92.6			
Java and Is	7,742	7,617	7,391	101.6	104.8	103,838	108,312	104,753	230,747	240,688	232,779	95.9	99.1			
Madura (1)	1,087	1,188	1,101	91.5	93.7	9,259	10,309	9,204	20,576	22,909	20,453	89.8	100.6			

s) Irrigated rice. — t) Unirrigated rice — (1) First crop.

and moderate in the centre and South of the Presidency. Heavy rains fell in the Central Provinces in the first half of October but the weather was clearer in the latter half of the month. According to a report of October 22 for the whole of India, weather conditions had been generally favourable at sowing time and the condition of the crop appeared to be good notwithstanding local damage by floods.

Egypt: Harvesting of early-sown areas of sefi is over, while in ordinary areas it is still in progress. Late-sown areas are still in process of ripening. Yields are below the average. Crop condition on 1 November was 94, as on 1 October, against 100 on 1 November 1930. Early sown areas of nili were maturing, while ordinary and late-sown areas were still at the flowering stage. Crop condition was normal.

POTATOES

Since the publication of the last Crop Report, very little new crop information has been received and that obtained refers to countries of less importance from the point of view of potato production.

The production of Spain is now also known and is considerably smaller than both that of last year (— 19.6 %) and the average of the preceding four years (— 11.1 %).

In Lithuania where the area planted with potatoes was slightly larger than that of last year, the crop was heavy and larger than the good crop of the preceding year by 11.2 % and the five-year average by 43.4 %.

Revisions of figures published in the preceding Crop Report have not had much influence on the figure of world production, being small and referring to countries contributing only a small part to total production.

For France, which contributes the largest percentage of the total, figures of production are not yet known. Persistent fine weather last month, however, favoured lifting and should also have improved the quality of the tubers.

Potatoes.

COUNTRIES	AREA					PRODUCTION								
	1931	1930	Aver.		% 1931	1931	1930	Aver.		1931	1930	Average		% 1931
			1925					1925				1925		
			to 1929					to 1929				to 1929		
1,000 acres		= 100 = 100		1,000 centals		1,000 bush. of 60 lbs.		= 100 = 100						
Germany. .	6,979	6,930	6,945	100.7	100.5	955,224	1,038,372	840,606	1,592,009	1,730,585	1,400,982	92.0	113.6	
Austria (s)	61	59	46	103.0	131.3	4,442	4,849	3,879	7,404	8,081	6,465	91.6	114.5	
Belgium (s)	418	407	406	102.6	102.7	47,677	53,642	46,051	79,461	89,401	76,751	88.9	103.5	
Belgium . .	402	402	408	100.0	98.4	60,949	65,310	74,752	101,580	103,847	124,584	93.3	81.5	
Bulgaria . .	32	35	26	92.9	122.3	1,720	1,852	829	2,866	3,086	1,381	92.9	207.5	
*Spain . . .	915 (r)	812	...	...	...	74,499	92,664	(r) 83,804	124,162	154,487 (r)	139,670	80.4	88.9
Estonia . .	168	168	166	99.7	100.9	17,300	19,028	15,748	28,999	31,713	26,246	91.4	110.5	
*Irish Fr. St.	348	346	369	100.4	94.3	...	52,359	52,714	...	87,265	87,354	...	...
Finland . .	174	175	172	99.3	101.0	15,997	17,314	16,784	26,661	23,856	27,972	92.4	95.3	
Engl. & Wal.	447	425	503	105.2	88.9	52,730	61,443	72,272	87,883	102,405	120,450	85.8	73.0	
*Scotland . .	128	123	144	103.8	88.9	...	19,264	21,862	...	32,107	36,437	...	...
*N. Ireland.	134	136	154	98.5	87.4	...	19,184	24,962	...	31,974	41,602	...	...
Hungary . .	710	678	652	105.6	108.9	32,445	40,597	43,333	54,074	67,660	72,221	79.9	74.9	
*Italy . . .	878	863	868	101.7	101.2	...	42,834	43,839	...	71,472	73,064	...	...
Latvia . . .	247	231	201	106.8	122.7	24,247	24,341	17,086	40,410	40,568	28,476	99.6	141.9	
Lithuania . .	415	403	347	102.0	119.6	46,297	41,643	32,287	77,161	69,404	53,810	111.2	143.4	
Luxemburg. .	40	40	40	99.1	99.3	4,762	3,525	3,818	7,937	5,878	6,383	135.1	124.7	
Malta . . .	7	7	7	90.2	97.0	670	644	599	1,117	1,074	999	104.0	111.8	
Norway . . .	116	117	120	99.8	97.3	18,207	16,838	18,913	30,344	23,143	31,521	107.8	96.3	
Netherlands	401	397	432	100.9	92.7	56,699	67,016	73,267	94,496	111,691	122,109	84.6	77.4	
Poland . . .	6,490	6,902	6,125	98.3	105.9	720,032	631,282	583,299	1,200,080	1,185,448	972,146	105.7	123.4	
Rumania (2)	489	468	482	104.5	101.4	52,882	39,963	42,587	87,302	66,654	70,876	131.0	123.0	
Sweden . . .	327	336	366	97.5	89.4	30,865	39,668	38,039	51,440	66,112	63,397	77.8	81.1	
Switzerland	113	120	117	94.2	96.7	18,598	13,007	15,633	28,164	21,678	26,054	129.9	108.1	
Czechoslov.	1,779	1,640	1,792	108.4	99.2	189,841	197,324	191,719	318,062	328,867	319,525	96.1	98.9	
—	
*U. S. S. R.	14,838	14,378	13,447	103.2	110.1	...	...	962,453	...	...	1,604,057	...	...
—	
Canada . . .	581	571	552	101.7	105.2	55,089	43,241	44,747	91,815	80,402	74,577	114.2	123.1	
Unit. States	3,506	3,187	3,369	110.7	104.1	229,200	205,800	228,306	382,000	343,000	380,502	111.4	100.4	
—	
Syria & Leb.	20	18	14	113.6	144.1	884	1,085	1,027	1,478	1,808	1,711	81.5	88.1	
—	
Algeria . . s	27	26	25	104.3	108.0	639	917	924	1,066	1,528	1,540	69.7	69.2	
Totals . . .	23,949	23,417	23,313	102.2	102.7	2,635,095	2,683,719	2,466,505	4,391,754	4,472,887	4,010,758	98.2	109.5	

* Countries not included in the totals. — s) Early crop. — f) Late crop. — (r) Average 1926 to 1929. — (2) Unmixed crop.

The present situation consequently seems to be that the 1931 crop, although smaller than the good one of 1930, has given very satisfactory yields.

V. B.

* * *

Austria : Lifting of late potatoes was effected rapidly. The tubers are in general small. Starch content of potatoes for industrial purposes is rather low. As regards quantity yields vary greatly but exceed previous forecasts. On November 1 the crop condition of potatoes was 2.4 against 2.5 on October 1 this year and 2.4 on November 1, 1930.

Belgium : The yield per acre of potatoes is slightly below the normal, and is estimated at 130-220 centals (220-370 bushels) per acre.

Bulgaria : Favoured by the weather, lifting was almost completed by the beginning of November.

Spain : The drought has caused considerable damage to the crops, production of which is considerably smaller than last year.

Irish Free State : The crop was disappointing, yields being down by about 20 per cent. on the average

France : The persistent fine weather has favoured the lifting of potatoes.

Great Britain and Northern Ireland : The weather in October allowed the land to dry well and conditions for lifting and clamping were generally very favourable. In England and Wales the crop was for the greater part under average and considerably affected by disease and the tubers were generally small. In Northern Ireland also practically all the crop had been lifted, quality being very good but yield rather disappointing, while in Scotland fully three-quarters had been lifted before the end of October.

Hungary : At the end of October the lifting of late potatoes was still in progress in places. Yields are in general poor.

Palestine : Preparation of the land is proceeding actively. In several colonies sowings of early varieties have been made with a view to placing the product on the British market.

Algeria : *Agrotis* caterpillars are causing serious loss in certain districts, especially in Mascara.

SUGAR SEASON

Weather conditions in October were decidedly favourable to the beet. Temperatures were generally warm and sometimes rose to a summer level and the soil was dried by the sun, facilitating lifting and carting of the bulbs in clean condition ; moreover, sugar content increased during the last stages of growth.

It is noteworthy that these favourable weather conditions occurred almost uniformly throughout Europe. In Yugoslavia and Russia they were a little less propitious but yet satisfactory.

In the first half of November, on the other hand, the weather deteriorated but had comparatively small effect on beet production as the crop had already been almost completely harvested in many countries.

The favourable October conditions brought about a slight improvement in the preliminary estimates.

An improvement is reported in Germany, Austria, Italy, the Netherlands and Czechoslovakia whereas preliminary estimates have been lowered in Bulgaria and Yugoslavia. For the whole of Europe, excluding the U. S. S. R., the decrease in sugar production compared with last season and the average of the preceding five seasons should now be 29 % and 9 % respectively whereas last month it was estimated at 30 % and 10 %.

In North America an increase is noted compared with previous estimates for the United States and a much larger one for Canada.

Taking together all the beet producing countries of Europe and North America and excluding the U. S. S. R., according to the latest estimates, the probable production of

Production of Beet-sugar (raw).

COUNTRIES	Total production during the season						% 1931-32	
	1931-32(1)	1930-31	Average 1925-26 to 1929-30	1931-32(1)	1930-31	Average 1925-26 to 1929-30	1930-31	average
	thousand centals			short tons			= 100	= 100
Germany	33,847	56,162	38,741	1,692,328	2,808,077	1,937,033	60	87
Austria	3,527	3,312	2,185	176,000	165,620	109,260	106	161
Belgium	6,001	6,138	5,949	300,035	306,894	297,449	98	101
Bulgaria	491	1,204	802	24,800	60,205	30,090	41	82
Denmark	2,756	3,899	3,303	133,000	185,000	165,147	75	83
Spain	6,383	6,369	4,613	320,000	318,449	240,688	100	133
Irish Free State	176	468	436	8,800	23,390	21,794	38	40
Finland	83	85	69	4,400	4,267	3,441	103	128
France	19,621	26,557	18,258	980,000	1,327,816	912,583	74	107
Great Britain	6,504	9,638	4,032	325,000	484,389	201,611	67	161
Hungary	3,417	5,154	4,356	171,000	257,712	219,317	66	78
Italy	7,961	9,382	7,039	398,000	469,090	351,957	85	113
Latvia	287	132 (2)	204	14,300	6,625 (2)	10,185	216	141
Netherlands	3,858	6,359	6,212	193,000	317,958	310,575	61	62
Poland	12,885	17,099	15,045	644,258	854,957	752,221	75	86
Rumania	1,323	3,620	2,745	70,000	181,010	187,268	37	48
Sweden	3,153	4,112	2,881	158,000	205,618	144,032	77	109
Switzerland	132	126	152	7,000	6,300	7,600	105	87
Czechoslovakia	17,481	25,173	26,016	874,021	1,258,614	1,300,763	69	67
Turkey	353	214	101	18,000	10,700	5,023	165	351
Yugoslavia	1,842	2,264	2,082	92,104	113,198	104,109	81	88
<i>Total, Europe . . . a)</i>	<i>132,096</i>	<i>187,317</i>	<i>145,251</i>	<i>6,603,846</i>	<i>9,365,870</i>	<i>7,262,406</i>	<i>71</i>	<i>91</i>
U. S. S. R.	40,234	33,283	24,066	2,012,000	1,914,400	1,203,288	105	167
<i>Total, Europe . . . b)</i>	<i>172,330</i>	<i>225,605</i>	<i>169,317</i>	<i>8,620,846</i>	<i>11,280,270</i>	<i>8,465,694</i>	<i>76</i>	<i>102</i>
Canada	1,058	1,075	789	53,000	53,763	33,485	98	138
United States	20,774	25,979	21,428	1,039,000	1,299,000	1,071,390	80	97
<i>Total, America . . .</i>	<i>21,832</i>	<i>27,054</i>	<i>22,197</i>	<i>1,092,000</i>	<i>1,352,763</i>	<i>1,109,825</i>	<i>81</i>	<i>98</i>
*Korea . . . . .	...	22	13	...	1,109	635	...	...
*Japan . . . . .	...	532	545	...	26,583	27,231	...	...
<i>Total, Asia</i>	<i>...</i>	<i>554</i>	<i>558</i>	<i>...</i>	<i>27,692</i>	<i>27,866</i>	<i>...</i>	<i>...</i>
*Australia . . . . .	...	75	48	...	3,752	2,410	...	...
General totals . . . { a)	153,928	214,371	167,448	7,760,846	10,718,633	8,372,321	72	92
 { b)	194,162	252,659	191,514	9,712,846	12,633,033	9,575,519	77	104

(*) Countries not included in the totals. — a) Not including U. S. S. R. — b) Including U. S. S. R. — (1) Approximate data. — (2) Average 1928-29 to 1929-30.

beet sugar in the season 1931-1932 is 28 % smaller than in 1930-1931 and 8 % below the average of the preceding five seasons.

For the U. S. S. R. the estimate published in October has been retained in the absence of later precise data. It is only known that up to November 1 lifting of beet and transport to the factories was proceeding in great difficulties; it seems, moreover, that yields per acre are a little smaller than was previously forecast. E. R.

* * *

Germany : At the beginning of November lifting of sugar-beet had still not been completely finished.

Austria : Pulling of sugar-beet was fairly well advanced by the end of October. The roots are rather small and in some cases not quite ripe. The sugar content varies greatly. Carting of sugar beet is being effected rapidly.

On November 1 the crop condition of sugar-beet was 2.7 against 2.4 on October 1, 1931 and 2.5 on November 1, 1930.

Belgium : Lifting of sugar beet has been effected under excellent conditions thanks to the fine weather ; yields have varied greatly according to region but it is believed that they will reach 250-270 centals (12-13 sh. tons) per acre with a sugar content varying from 16.5 % to 18 %.

Bulgaria : October weather favoured lifting and transport of the beets.

Spain : The crop has been especially favoured by the weather, which has checked the spreading of *Cercospora beticola* which, in recent years, has caused considerable damage.

The figures in the following table are supplied by the " Association Internationale Sucrière " of Vienna.

COUNTRIES	Sugar-beet		Raw sugar	
	1931	1930	1931-32	1930-31
	Centals			
Germany	207,176,800	350,364,980	33,847,000	56,162,310
Austria	20,937,000	21,239,870	3,512,000	3,312,880
Belgium	27,485,000	41,419,380	4,400,900	6,178,540
Bulgaria	3,861,920	8,362,650	545,000	1,289,000
Denmark	16,580,000	22,648,000	2,690,000	3,699,000
Irish Free State	1,100,000	3,538,000	180,000	570,000
Finland	780,000	698,250	82,000	85,340
Hungary	18,044,500	34,233,910	2,707,420	5,162,600
Italy	54,230,000	73,507,000	7,961,000	9,084,200
Poland	69,400,000	102,141,060	11,510,000	17,243,930
Roumania	7,100,000	20,700,000	990,000	3,351,700
Sweden	19,330,000	26,125,170	3,192,000	4,112,410
Czechoslovakia	97,117,020	148,987,640	17,480,670	25,193,560
Turkey	2,275,570	1,260,000	850,000	214,000
Yugoslavia	14,231,000	16,459,100	1,842,100	2,264,000
Total	559,628,810	871,685,010	91,290,090	137,923,470
	Short tons			
Germany	10,358,700	17,518,011	1,692,330	2,808,077
Austria	1,046,900	1,061,979	175,600	165,642
Belgium	1,373,200	2,070,941	220,040	308,923
Bulgaria	193,093	418,127	27,200	64,450
Denmark	829,000	1,132,400	134,000	185,000
Irish Free State	60,000	176,900	9,000	29,000
Finland	36,000	34,912	4,100	4,267
Hungary	902,210	1,711,672	135,369	258,127
Italy	2,714,000	3,675,300	398,000	454,200
Poland	3,470,000	5,106,988	575,000	862,185
Roumania	350,000	1,040,000	50,000	167,580
Sweden	967,000	1,306,241	159,600	205,618
Czechoslovakia	4,855,785	7,449,261	674,021	1,259,661
Turkey	113,777	63,000	18,000	10,700
Yugoslavia	711,500	822,940	92,104	113,198
Total	27,361,165	42,588,637	4,564,364	6,896,628

Irish Free State : Weather in October was dry and genial ; the crop made seasonal progress. The factory campaign was not expected to commence until the end of November.

France : Fine weather has permitted the lifting and carting of the beet under good conditions. Quantity is below forecasts but content is exceptionally good.

Great Britain and Northern Ireland : There was very little rain in October ; day temperatures were generally mild but there were sharp night frosts in the latter part of the month. The land dried well, enabling beet to be lifted in clean condition except on some heavy soils. It was expected that production would be substantially less than last year. The campaign has this years been later in opening.

Hungary : At the beginning of November an improvement was reported in the crop condition of beet thanks to beneficial precipitation

U. S. S. R. : At the close of the first decade of November no more than 22 million centals (1.1 million short tons) had been harvested. Transport to the factories was carried out with much difficulty and about half of the roots already lifted remained in the fields.

Sugar-beet.

COUNTRIES	AREA					PRODUCTION							
	1931	1930	Aver. 1925 to 1929	% 1931		1931	1930	Aver. 1925 to 1929	1931	1930	Aver. 1925 to 1929	% 1931	
				1930	Aver. = 100 = 100							1930	Aver. = 100 = 100
1,000 acres					1,000 centals			1,000 short tons					
Germany	941	1,194	1,083	78.9	88.6	233,064	328,900	237,119	11,683	16,445	11,856	71.0	98.5
Austria	106	88	62	121.1	171.4	23,534	21,457	13,724	1,177	1,078	686	109.7	171.5
Belgium	140	140	162	100.0	86.4	37,519	41,123	40,705	1,876	2,056	2,035	91.2	92.2
Bulgaria	37	49	35	76.0	106.1	5,291	6,889	4,247	265	344	212	76.8	124.6
*Spain . . . . .	...	197	181	...	...	65,295	51,197	34,872	3,265	2,560	1,744	127.5	187.2
Finland	5	3	5	161.6	94.3	794	683	773	40	34	39	116.1	102.7
*England and Wales	233	347	162	67.1	144.0	...	68,180	28,306	...	3,407	1,415	...	...
*Scotland	1	2	4	68.1	30.0	...	269	442	...	13	22	...	...
Hungary	142	183	168	77.3	84.5	22,748	32,210	32,947	1,137	1,610	1,647	70.6	69.0
Italy	266	277	226	98.2	117.8	50,708	66,600	51,465	2,535	3,330	2,573	76.1	98.5
Netherlands	91	142	157	64.2	58.1	22,346	47,127	46,341	1,117	2,356	2,317	47.4	48.2
*Poland	376	457	510	82.3	73.8	...	103,993	92,177	...	5,200	4,609	...	...
Sweden	91	91	78	100.0	116.9	19,842	26,787	19,233	992	1,399	962	74.1	103.2
Czechoslovakia	441	554	675	79.7	65.4	102,872	141,567	157,619	5,144	7,075	7,881	72.7	85.3
U. S. S. R.	3,332	2,533	1,626	131.6	204.9	374,787	334,434	186,268	18,739	16,721	9,318	112.1	201.2
Canada	52	52	46	99.0	113.4	9,420	9,420	8,685	471	471	434	100.0	108.5
United States	(1) 754	(2) 776	(2) 875	97.2	111.6	152,400	184,000	147,105	7,620	9,200	7,355	82.8	103.6
Totals	6,338	6,062	4,978	105.3	128.6	1,855,918	1,241,197	946,231	52,796	62,057	47,310	85.1	111.6

* Countries not included in the totals. — (1) Planted acreage, 90 % of which is usually harvested. — (2) Area harvested.

United States : Hot weather during September caused a continued deterioration of the crop, which was several weeks late. Considerable borer damage was also reported from some localities. In the week ended on about November 6, grinding of sugar-cane began in Louisiana. Digging of sugar-beets progressed well in most parts in the week ended on about November 6.

United States : The recent estimate of production of cane is 47,440,000 centals (2,372,000 sh. tons), 51,180,000 (2,559,000) in 1930 and 43,524,000 (2,176,000) on the average for the preceding five years. Percentages : 93 and 109. The corresponding figures of production of sugar are 3,260,000 centals (163,000 short tons) ; 3,674,000 (184,000) ; and 1,911,000 (96,000) ; percentages : 89 and 170.

India : Moderate to heavy rains in the first half of October damaged cane in the United Provinces but very little rain fell in the latter half of the month, at the end of which condition was good and prospects were favourable. On about October 13 the probable production of the United Provinces was estimated at about 88 % of the normal. Light, scattered rains fell in October in parts of the Punjab; towards the end of the month condition varied from average to good. Variable rains fell in October in some parts of Bihar and Orissa; at the end of the month crop condition was good. According to a report of October 22, weather conditions had, on the whole, favoured the sugar-cane crop and condition was good.

Java and Madura : According to the Sugar Experimental Station (P. O. J.) weather in October was typical of the change in the monsoons. There is generally adequate water. Except in certain fields for which irrigation is difficult the new plantings are in very satisfactory condition and cultivation is going on well. Disease is not too prominent.

Egypt : The favourable weather conditions have accelerated growth and ripening of the cane. Early-sown areas are almost completely matured. Some areas are being cut for local consumption. Crop condition is satisfactory; on 1 November it was 102 against 101 on 1 October and 102 on 1 November 1930.

Union of South Africa : Crop condition of cane in September was 16 % below normal. The weather was very dry but conditions showed a slight improvement on the previous month. Production of sugar in 1931-32 is now estimated at 6,588,000 centals (329,400 sh. tons), 16 % below that of 1930-31 and 24 % above the average for the five years ending 1929-30.

Hawaii : Production of sugar in 1931-32 is effected to be 19,120,000 centals (956,000 sh. tons) against 19,160,000 (958,000) in 1930-31 and 17,307,000 (865,300), the average for 1925-26 to 1929-30, percentages with respect to the latter figures being 100 and 110.

Territory under Japanese mandate : Production of sugar-cane in 1930-31 is estimated at 8,129,000 centals (406,000 short tons) against 4,917,000 (246,000) in 1929-30 and 3,112,000 (156,000), the average of the five years 1924-25 to 1928-29; percentages 165 and 261. The corresponding production of sugar is estimated at 850,000 centals (42,500 short tons) against 457,000 (22,800) and 222,000 (11,100); percentages 186 and 382.

VINES

For France the first crop declarations are becoming available and generally coincide with the preceding forecasts of a total wine production of 1,230-1,275 million Imperial gallons (1,480-1,530 million American gallons). Some partial data at present known also confirm an abundant production in southern regions. In fact the Department of Hérault reports a production of about 277,521,000 Imperial gallons (333,278,000 American gallons) against 192,281,000 (230,912,000) in 1930 and that of Gard 92,588,000 (111,189,000) against 63,353,000 (76,081,000). The French market is characterised

by weak prices, especially in the South where merchants are purchasing only the quantities necessary to cover immediate requirements, and by great uncertainty as the application of the various legislative measures promulgated during the year may depend on the volume of production during the present season.

The production of must in Spain is considered to be very poor, being not only 24 % below the average of the preceding quinquennium but also smaller than the very small crop of 1930. The vintage was effected under conditions which were exceptionally

Vines.

COUNTRIES	AREA					PRODUCTION							
	1931	1930	Aver. 1925 to 1929	1931		1931	1930	Aver. 1925 to 1929	1931	1930	Aver. 1925 to 1929	% 1931	
				1930	Aver.							1930	Aver.
1,000 acres		= 100	= 100	1,000 Imperial gallons		1,000 Americ. gall.		= 100	= 100				
Germany. .	204	203	201	100.5	101.4	...	61,895	35,549	...	74,331	42,691	...	...
Austria (1).	78	77	80	101.0	96.8	29,565	26,450	12,738	35,505	31,764	15,297	111.8	232.1
Bulgaria. .	217	205	199	106.0	114.8	61,769	57,744	33,235	74,179	69,345	39,912	107.0	185.9
Spain (2). .	...	3,495	3,429	...	...	396,504	400,972	518,520	476,166	481,531	622,696	98.8	76.5
Greece (2). .	...	375	277	...	...	35,482	30,897	56,958	42,611	36,504	63,401	116.7	62.3
Italy . { s	1,908	1,939	2,078	98.4	91.8	...	798,903	906,147	...	959,441	1,088,201	...	...
{ f	8,398	8,584	8,567	97.8	98.0	...	...	...	...	...	...	...	...
Luxemburg.	3	3	4	100.0	84.5	1,936	844	1,063	2,325	1,014	1,277	229.3	182.1
Portugal. .	...	...	856	...	...	148,483	129,612	132,445	178,315	155,652	159,054	114.6	112.1
Switzerland	...	33	35	...	...	14,958	14,078	12,282	17,964	16,907	14,750	106.2	121.8
Czechoslov.	47	44	42	105.5	111.4	...	10,427	4,864	...	12,521	5,841	...	...
Syria and Lebanon.	124	126	123	98.6	101.0	—	—	—	—	—	—	—	—
Algeria . .	730	671	(3) 595	108.9	122.6	299,167	299,169	231,277	359,272	359,275	277,743	100.0	129.4
Fr. Morocco	22	22	15	100.0	149.9	5,543	4,176	3,080	6,657	5,015	3,698	132.8	180.0
Tunis . . .	88	87	74	113.1	133.5	15,545	21,998	18,668	18,668	26,417	22,694	70.7	82.8

s) Unmixed crop. — t) Mixed crop. — (1) Bearing crop. — (2) Must. — (3) Average 1926, 1928 and 1929.

bad in the eastern regions, nearly average in Lamancha and normal in Catalonia, Aragon and some regions of Andalusia.

Prices are in general well maintained and on some markets show a tendency to rise, particularly for wines of the old crop.

A commercial agreement fixes at 39,596,000 Imperial gallons (47,551,000 American gallons the quota of Spanish wines to be admitted into France.

For Italy, forecasts are in general less good than those of last month ; quality is generally maintained at a rather high level and the alcoholic content is considered to be above the average ; the vintage has resulted in a production at the most equal to or perhaps a little smaller than that of 1930, which reached 798.5 million Imperial gallons (958.9 million American gallons) ; a private estimate is as low as 692.9 million Imperial gallons (832.1 million American gallons). Stocks at the beginning of the season 1931-32 were considered to be not very abundant. Carry-over stocks are estimated at only about 66 million Imperial gallons (79 million American gallons), to which should be added the current production. This situation cannot fail to have a favourable repercussion on the Italian market, which has been restricted by the steps taken in France to prohibit the import of Italian wines until May of next year, the annual quota fixed at 5,499,000 Imperial gallons (6,604,000 American gallons) having been exhausted. During

the last few days, an agreement has been reached between France and Italy which solves the problems arising for the two countries in connection with the import of Italian wines into France. This agreement stipulates that from today until March 31, 1932 there shall be admitted into France 2,420,000 Imperial gallons (2,906,000 million American gallons) of wine; the quota for 1932, which will enter into force in April, is fixed at a total of 11,439,000 Imperial gallons (13,737,000 American gallons) of which 5,499,000 Imperial gallons (6,604,000 American gallons) is subject to the preferential tariff.

Prices of new wine have, during the present month, shown a satisfactory tendency to rise and are well maintained; forecasts favour a rise although consumption on the home markets shows signs a slight but constant reduction. This consumption is estimated at 19-20 Imperial gallons (22-24 American gallons) yearly per head, compared with an increase of $1/3$ during the pre-war period.

With regard to the less important producing countries, it is estimated that in Germany, production will be rather poor due to excessive humidity during the period of ripening which has caused fairly considerable damage by rotting in different regions.

In Hungary and Rumania vintage results vary from good to satisfactory and in Austria they are very good; quality promises to be good as regards both sugar content of the must and alcoholic degree of the wine.

In Greece production of wine is considerably larger than in 1930 but much below the average for the period 1925-1929.

According to a recent official estimate, the Algerian production, will not exceed that of 1930 although the young plantations have just begun to bear, and the market shows some signs of heaviness.

M. C.

* * *

Austria : Taking advantage of the fine weather in the first half of October, vine growers prolonged harvesting in some of the smaller vineyards. The musts thus obtained are of excellent quality and reach even 26 degrees according to the Klosterneuburg scale. At the beginning of November, the crop condition of vines was 2.3 as at the beginning of October of this year, against 2.0 on November 1, 1930.

Spain : Production of grapes this year is 68,084,000 centals an increase of 2 % on that of last year (66,724,000 centals) and a decrease of 21 % on the average of the five years ending 1929 (86,646,000 centals).

France : The weather has greatly aided work and the vintage has been completed in fine, dry weather.

Hungary : At the beginning of November the vintage was in large part terminated. Unit yields varied greatly according to the situation of vineyard and variety of the grapes. Content of must sugar varied from 14 to 30 degrees Klosterneuburg.

Italy : It is now certain that production is below expectations as to quantity but of good quality. The wines are of very high alcoholic content.

United States : Low prices in most sections of the country resulted in delayed harvest of grapes with deterioration of the crop in many instances. Production of grapes is now estimated at 32,200,000 centals (1,610,000 short tons) a small reduction having

been made since October; production was 49,191,000 (2,460,000) last year and 48,062,000 (2,403,000) on the average for 1925-1929; percentages: 65.5 and 67.0.

Palestine : The vintage is over.

Algeria : The vintage is over. The wines are of good quality. Production, despite the number of new plantings coming into bearing this year, does not seem to have exceeded that of last year.

Tunisia : The vines were greatly damaged by the scirocco, which reduced yields by 25 to 75 % in a number of centres. The vintage is at an end.

Union of South Africa : The heavy snowfall on the mountains at the beginning of September caused some frost damage to vines in Cape Province.

OLIVES

Portugal : Production of olive oil this season is estimated at 1,504,000 centals (19,763,000 American gallons) against 1,056,000 (13,883,000) on the average for the five years ending 1929-30, an increase of 42.4 %.

Palestine : The harvest of green olives is in progress. In the groves of the plain the fruit is maturing. Crop condition is good.

Algeria : Gathering of fruit for preserves is in progress. Olive fly has caused some damage. Crop condition is average as last month, and a little better than on 1 November 1930.

Tunisia : Growth is good and despite a rather heavy fall of fruit in some localities due to hot winds, the crop is very good.

COTTON

The report published on November 9th by the Government of the United States indicates an increase of 2,959,000 centals (619,000 bales) or 3.8 %, compared with the October estimate and of about 1,400,000 centals (300,000 bales) on the average of private estimates. Compared with the first forecast made by the Government last August the increase is 6,305,000 centals (1,319,000 bales) or 8.5 %. The yield forecast is 197.8 lb per acre, exceeded only seven times since 1866. In order of size, while the area this year has so far been exceeded only six times, the production forecast is smaller only than the record crop of 1926-1927, which was 85,932,000 centals (17,977,000 bales).

During October the weather remained exceptionally favourable for picking and ginning, and both are greatly in advance of previous years, giving rise to a large influx of

cotton on the market. Ginning, which proceeded very slowly at the beginning of the season, was accelerated in October and the quantity ginned up to and including October 17 was much larger than for the corresponding periods of the preceding five seasons. The quantity ginned from October 1 to 17 amounted to 4,090,000 running bales, a figure never reached before in any period between two consecutive ginning reports.

The grade and staple of the cotton picked are the best obtained in the United States for many years past. In fact, of the cotton ginned up to and including September 30, only 3 3 % was untenderable compared with 14.2 % last year. Lastly, it should be noted that the average weight of the bales is heavier than in any previous season. This, according to the Government report, constitutes an important factor in the interpretation of the figures of cotton ginned which are, as is known, published in running bales and not in measures of weight.

Cotton.

COUNTRIES	AREA					PRODUCTION							
	1931/32	1930/31	Aver.		% 1931/32	1931/32	1930/31	Aver.		% 1931/32	1930/31	Aver.	
			1925/26	to				1925/26	to				
			1929/30	1931				1929/30	1931				
1,000 acres					1,000 centals			1,000 bales of 478 lbs.			= 100		
Bulgaria	13	14	11	96.6	120.5	24	21	15	5	4	3	112.3	166.6
Italy	2	9	9	20.8	26.9	4	21	16	1	4	3	17.7	23.8
*U. S. S. R. . .	5,825	3,870	1,974	150.5	295.1	...	7,403	5,090	...	1,549	1,052	...	...
United States .	40,889	45,091	44,882	90.7	91.1	80,796	66,595	72,983	16,903	13,332	15,268	121.3	110.7
Mexico	326	390	472	83.5	60.1	1,011	848	1,208	211	178	253	119.1	83.6
China	5,238	5,693	4,474	92.0	117.1	8,339	11,742	9,100	1,849	2,456	1,904	75.3	97.1
*Korea	461	463	495	99.6	93.0	...	726	668	...	152	183	...	...
*India (1) . . .	19,654	20,506	21,584	95.8	91.1	...	19,230	22,437	...	4,033	4,704	...	...
*Syria & Lebanon	76	60	58	126.3	130.9	...	59	47	...	12	10	...	...
Algeria	3	10	15	31.4	21.2	5	25	28	1	5	6	19.7	17.4
Egypt	1,747	2,162	1,823	80.8	95.6	6,355	8,005	7,588	1,329	1,675	1,587	79.4	83.8
Eritrea	7	7	7	107.1	111.1	11	8	8	2	2	2	140.8	140.4
Ouganda	867	740	615	117.2	140.9	1,000	744	620	210	156	130	133.5	160.0
It. Somaliland .	10	19	16	51.8	60.6	17	17	20	4	3	4	103.7	84.4
*Tanganyika . .	—	—	—	—	—	56	93	98	12	19	21	60.3	56.8
Totals	49,162	54,135	52,329	90.7	93.8	96,662	88,626	91,586	20,515	16,415	19,160	111.4	107.1

* Countries not included in the totals. — (x) Estimate of the second report; area representing about 90 % of the total area.

The publication of all these data, which greatly exceed private forecasts, and constitute a strong group of bearish factors, has not disturbed the market. The factors which are at present exerting the most influence on consumption and prices are: the sterling exchange, the rise in silver, customs tariff policy, political tension in the Far East and fluctuations on the bond and cereal markets. Moreover, an important psychological influence is also exercised by current international financial and political problems. In the month under consideration, prices have not shown any large changes or fluctuations. The market has been active and consignments have been satisfactory. Large purchases have been made, especially by the Far Eastern countries and England. The farmers and co-operative associations are continuing to accumulate cotton, being supported by the banks and the Federal Farm Board with the express purpose of keeping off the market until 31 July 1932, at least 6,500,000 bales. Mean-

while it appears that no further definite steps have been taken to restrict the area to be planted to cotton in 1932.

The Egyptian crop has this year been severely damaged by insects, atmospheric humidity, carelessness in cultural operations and in picking due to the very bad financial conditions of the cultivators and persistent and prolonged deficiency of irrigation water in the past months. It is expected that the second estimate of production which will be published in December will show a reduction on the first (see last month's Crop Report). The superior grades of Sakellaridis are in great demand owing to their scarcity, due to the restriction of the crop and to the bad weather during the season. Of the other varieties Maarad is much in demand. In comparison with last month, ginning has greatly increased though remaining at a lower level than in previous years. The increase is due principally to purchases by exporters and to the need of growers to realise their crop as quickly as possible.

The Government has already begun by means of the provincial agents of the Ministry of Agriculture to make known the regulations decreed for the restriction of the crop in the coming season. The market showed a certain activity and firmness and prices presented a somewhat oscillatory movement, with a tendency to fall.

The Indian crop is already partly on the market. Its quality does not appear good and damage from the inclement weather is considerable. The market is active and the rise in silver favours imports of cotton, despite the recent accentuation of the customs tariff.

I. S.

* * *

U. S. S. R. : There is still a lack of any official estimate of production in the current season. Given the large increase in area cultivated with respect last year (about 50 %) production was forecast, despite the drought in certain parts of Central Asia, to be considerable above that of last year, which was, according to the most recent data, 7,403,000 centals (1,549,000 bales) of ginned cotton. Acquisitions of cotton in October reached 71 % of the amount planned for the month. From the commencement of the season to 1 November acquisitions represent 41.8 % of the total planned for the season, against the 55 % planned for that period. In Central Asia, the chief centre of cotton production in the Union, acquisitions in November reached 63.1 % of the quantity planned for the month and from the commencement of the season to 1 November 40.7 % of the total planned for the season.

United States : In the week ended on November 6, cotton picking proceeded under very good conditions apart from slight interruption by rain in central parts of the belt. Mild, sunny and mostly dry weather this autumn has been unusually favourable for picking which is well advanced. Frosts during the week in the north-western belt did no appreciable harm but hastened the opening of bolls ; nearly all the cotton is now open. In the following week the weather continued generally very favourable and picking was well forward. According to a telegram dated November 18th received from the U. S. Department of Agriculture, picking of cotton has been delayed by rain. The quantity of cotton ginned not including linters, to close of business on 17 October amounts to 9,498,000 running bales (counting round bales as half-bales), against 9,255,000 and 9,095,000 bales for the corresponding periods of 1930 and 1929 ; to close of business on 31 October, 12,130,000 running bales, against 10,864,000 in 1930 and 10,892,000 in

1929 to close of business on 13 November, 14,210,000 running bales, against 11,963 000 in 1930 and 11,890,000 in 1929.

Mexico : Cotton has been ginned under good conditions and has given satisfactory yields. In the southern coastal region of the Pacific sowings at the end of September proceeded under favourable conditions.

India : Heavy rains in Bombay Presidency in the first half of October damaged the cotton crop in the Deccan but the latter half was dryer and picking made progress in the Deccan. Cotton in the Central Provinces was damaged in the first half of October by heavy rains, weeds and waterlogging, but during the remainder of the month the weather was clear and cool. Variable rains fell during the month in Madras and in the last week falls were heavy in parts of the Circars and Carnatic and moderate in the centre and South of the Presidency. On October 31 condition was fair. Light, scattered rains fell in the Punjab during October and local damage was caused by rain and insects. Reports of damage by bollworm continued during the month, especially to American cotton in Multan and also in Shahpur and Lyallpur. According to a telegram of October 29 received from the Punjab Government cotton picking was in progress at that date and yields were generally below normal to normal. A later telegram of November 12 gave the estimate of crop condition to be 83 % of the normal, the low figure being the result of damage caused by bollworm, winds and storms; condition at the same date of last year was 87 % of the normal.

Algeria : Growth is everywhere vigorous but damage by pink bollworm is very widespread.

Egypt : In October weather was not favourable to ripening and opening of late bolls in Lower Egypt, owing to variations in temperature and increase in night coolness. On the other hand it has been mild in Middle Egypt, and the opening of the healthy portions of late bolls has been favoured. Rains fell at the beginning of the month in certain provinces of Lower and Middle Egypt. The attacks of pink bollworm in all Egypt have reached 99 % for Sakellaridis and 94 % for Ashmuni and Zagora, thus exceeding the normal.

Picking is over save in certain very late areas in the north of the Delta. The second picking, which tends more and more to lose its importance, has given yields much below expectations in Lower Egypt. The third picking has practically disappeared in recent years. Pulling of dried stems is completed over vast areas and is continuing immediately after the harvest so as to prepare the ground for the winter crops. Unit yields vary according to district and variety. They are almost the same as last year for Sakellaridis and 10-20 % less for other varieties. Yield in ginning is 1-3 % less than that of the preceding crop.

Cotton ginned from 1 September to 31 October :

Varieties	1931		1930	
	Cents	Bales	Cents	Bales
Sakellaridis	218,130	45,630	339,630	71,050
Other varieties	1,623,810	339,710	1,845,760	386,140
Total	1,841,940	385,340	2,185,390	457,190
Scarto (linters)	41,480	8,680	41,560	8,700

Varieties	Centals	1929 Bales	Centals	1928 Bales
Sakellaridis	524,700	109,770	748,110	156,510
Other varieties	2,120,840	443,690	2,309,870	483,240
<i>Total</i>	<i>2,645,540</i>	<i>553,460</i>	<i>3,057,980</i>	<i>639,750</i>
Scarto (linters)	50,190	10,500	72,830	15,240

The corresponding figures as on 30 September 1931 are respectively as follows : 20,230 centals (4,230 bales) ; 341,470 (71,440) ; 361,700 (75,670) ; 6,340 (1,330).

Uganda : During September meteorological conditions generally favoured the crop, except in some exceptional localities where excessive rain and hail caused more or less considerable damage. Loss from disease has been quite small and localised. On the whole crop condition at the beginning of October was satisfactory and prospects were generally good, though less satisfactory in the Lango and Gulo districts, owing to damage by disease and excessive rains. According to a first provisional and very approximate estimate, reproduced in the general table for cotton, which is subject to more or less important modifications from weather conditions, total production this season is considerably above that of last season (by over 30 %) and the average of the preceding quinquennium (by about 60 %)

FLAX

Great Britain and Northern Ireland : Quality and yield in Northern Ireland appears to be fair.

U. S. S. R. : According to the Commissariat for Agriculture on 1st November, 86 % of the crop has been spread in the fields or water-retted and 13 % had been reduced to fibre.

Argentina : The third estimate of area sown is 295,000 acres above the second, published in the last Crop Report (8,640,000 against 8,345,000 acres) and indicates the largest extension of this crop so far in Argentina. Thanks to favourable weather crop condition is good to very good. In the north of Buenos Aires province there is one of the most important zones of production ; the plants have a vigorous appearance and good colour. In the Province of Santa Fé a very good crop is reported, especially in the north. In the Province of Cordoba, crop condition is also good ; only in the South-west development was a little backward toward the middle of October. In the other provinces also good yields are expected. — (Telegram of 17 November) : In some districts there have been slight losses caused by storms, frosts, hail, rust and excessive rains. In the south of the province of Buenos Aires frosts have caused some damage and the crop requires water. In the province of Santa Fé, on the other hand, excessive rains have been the cause of damage. In all other areas the crop is in good condition. For the north of Santa Fé harvesting was in full swing.

Flax.

COUNTRIES	AREA					PRODUCTION						
			Aver.		% 1931			Aver.			Aver.	% 1931
			1925					1925			1925	
	1931	1930	to	1930	Aver.	1931	1930	to	1931	1930	to	1930
			1929	= 100	= 100			1929			1929	= 100 = 100
	1,000 acres					1,000 centals			1,000 pounds			

Fibre.

Germany.	16	27	49	59.8	33.4 (1)	117	—	—	1)11,684	—	—	—	—
Austria †)	8	8 (2)	11	90.3	70.2	109	127 (2)	152	10,985	12,694 (2)	15,225	86.1	71.8
Belgium.	36	56	59	63.6	60.5	192	325	580	19,156	32,499	57,950	58.9	33.1
Bulgaria.	2	1	1	216.0	204.1	2	3	1	176	262	147	67.3	119.9
Estonia.	45	80	89	56.3	50.8	130	237	221	13,008	23,745	22,084	54.8	58.9
Finland (3). . . .	10	14	13	72.7	74.6	...	35	35	...	8,527	8,508	...	...
Northern Ireland	7	29	33	26.1	22.4	...	120	132	...	12,032	13,761	...	...
Hungary †)	44	36	7	123.0	—	...	869	—	...	86,913	—	...	...
Latvia (3)	104	128	163	81.1	63.7	331	424	487	33,056	42,395	48,714	78.0	67.9
Lithuania (3) . . .	133	204	211	65.3	63.2	518	642	802	51,765	64,183	80,199	80.6	64.5
Netherlands	16	37	37	43.2	43.2	82	230	253	8,234	22,957	25,346	35.9	32.5
Czechoslovakia . .	23	31	52	72.7	44.1	83	128	238	8,344	12,816	23,764	65.1	35.1
U. S. S. R. (4) . .	5,733	4,278	3,271	134.0	175.3	...	9,449	7,064	...	944,904	706,425	...	...

*Linseed.*Thousand bushels
of 56 pounds.

*Germany.	16	27	49	59.8	33.4 (1)	73	—	—	(1) 130	—	—	—	—
Austria	5	5	8	90.9	59.8	18	19	27	32	34	49	94.1	65.8
Belgium.	36	56	59	63.6	60.5	127	233	287	227	417	512	54.4	44.3
Bulgaria.	2	1	1	216.0	294.1	11	4	2	19	7	3	290.3	594.1
Estonia.	45	80	89	56.3	50.8	141	279	222	251	499	396	50.4	63.4
*Italy	24	27	44	90.6	55.5	...	125	206	...	223	368	...	...
Latvia (3)	104	128	163	81.1	63.7	326	410	452	582	733	808	79.4	72.0
Lithuania (3) . . .	133	204	211	65.3	63.2	620	858	824	1,107	1,532	1,471	72.3	75.3
Czechoslovakia. . .	23	31	52	72.7	44.1	72	94	202	128	169	361	75.7	35.3
*U.S.S.R.	7,735	5,553	4,267	139.3	181.3	...	...	13,255	...	...	23,670	...	...
Canada	623	582	563	107.9	111.5	1,594	2,468	2,553	2,847	4,399	4,558	64.7	62.5
United States . . .	3,132	3,692	2,909	84.8	107.7	3,323	11,967	11,713	11,300	21,369	20,917	52.9	54.0
India	3,020	2,802	3,392	107.8	89.0	8,467	8,512	8,848	15,120	15,200	15,800	99.5	95.7
*Eritrea	2	—	10	—	31.2	9	—	38	18	—	63	—	23.1
French Morocco . .	67	58	48	118.1	140.3	411	251	229	734	448	408	164.0	179.9
*Argentina	538,640	575,511	535,918	115.0	124.9	...	39,348	41,099	...	70,265	73,391	...	...
*Uruguay	606	402	204	150.7	297.2	...	2,575	1,254	...	4,599	2,240	...	...
Grand Total	7,195	7,633	7,495	94.1	96.9	18,115	25,099	25,359	32,347	44,967	45,283	72.2	71.4

†) Production expressed in dried flax straw. — * Countries not included in the total. — (1) Private estimate.
— (2) Average 1927 to 1929. — (3) Flax and hemp. — (4) Dolgunetz quality. — (5) Area sown.

Uruguay: Not only preparatory cultivations but sowings were made under excellent conditions. Weather was exceptionally favourable. The Government has carried on active propaganda to intensify flax cultivation. The area to be devoted to the crop this year is about 20 % above that of last year.

HEMP

U. S. S. R. . On 25 October hemp had been pulled on about 70 % of the area sown. The amount placed in retting on 25 October was 46.7 % of that harvested.

Hemp.

COUNTRIES	AREA				PRODUCTION			
	1931	1930	Average 1925 to 1929	% 1931	1931	1930	Average 1925 to 1929	% 1931
				1930				1930
	1,000 acres			= 100	1,000 pounds			= 100

Fibre.

Germany (1)	1	1	4	80.4	19.5	—	—	—	—	—
Austria	1	1	(2)	1	80.4	89.9	(3)	1,301	(3)	1,789
Bulgaria	9	9	10	101.7	93.6	4,189	3,584	3,028	116.9	138.3
Italy	161	214	236	75.2	68.5	...	201,400	222,033	...	...
Czechoslovakia . . .	21	15	26	134.0	78.7	10,888	8,959	16,436	121.5	66.2
—										
U. S. S. R.	2,277	1,854	2,268	122.8	100.4	...	...	695,913	...	...
—										
Syria	6	6	6	96.4	94.5	...	3,576	3,761	...	...

Hempseed.

Austria	(4)	(4)	1	82.9	61.5	154	198	266	78.0	58.1
Bulgaria	9	9	10	101.7	93.6	3,527	3,960	2,525	89.1	139.7
Czechoslovakia . . .	21	15	26	134.0	78.7	8,020	6,340	11,776	126.5	68.1
—										
U. S. S. R.	2,277	1,854	2,268	122.8	100.4	...	...	1,229,963	...	...

(1) Hemp and other textile plants. — (2) Average 1927 to 1929. — (3) Dried fibre. — (4) Area under 500 acres.

OTHER PRODUCTS

Tea.

Ceylon : During September wet weather predominated in the Southwest and East of the island. The crop has been somewhat damaged in the Southwest. Crop condition of tea on October 1 was average.

India : In North India the weather generally in September was favourable for growth and a good crop was harvested. Immediate prospects are fairly good. Statistics to the end of September recorded a decrease of 3 $\frac{1}{3}$ million lbs. as compared with the same period of last year.

In South India, the weather generally has been unseasonable but immediate last year. prospects are rather brighter. The outturn was 3 $\frac{1}{2}$ % below that to the same date of

Coffee.

It is well-known that production of coffee has undergone a development excessive in relation to world needs. The statistics of production that are available are still, however, in most cases very imperfect. Often, owing to the lack of crop estimates, recourse must be had to export data as indices of production. Still, it may be admitted that the results on the whole represent fairly faithfully in their main outlines the actual situation. According to these statistics the quantities harvested in the five-year periods 1909-10 to 1913-14 and 1926-27 to 1930-31 were respectively as follows :

Average annual production of coffee
(in thousand pounds)

	1909-10 to 1913-14	1926-27 to 1930-31
Brazil	1,753,000	2,535,000
Other countries	959,000	1,587,000
	<hr/>	<hr/>
Total	2,712,000	4,122,000

There has thus, between the two periods, been an increase of about 50 % in production. The increase is due, on the one hand, to Brazil, with its record crops in 1927-28 and 1929-30, on the other hand, to the development of coffee cultivation in a series of other countries, notably Colombia, Salvador, the Netherlands East Indies and several producing countries of Africa.

As regards consumption the total quantities imported into the non-producing countries—quantities that, grosso modo, may be considered as equivalent to real consumption—are as follows :

Average annual import of coffee into non-producing countries.
(in thousand pounds)

	1909-13	1926-30
Europe	1,270,000	1,398,000
North America	900,000	1,523,000
Other countries	173,000	212,000
	<hr/>	<hr/>
Total	2,343,000	3,133,000

According to these figures the growth of consumption between these two periods is about 34 %. But, taking account of the fact that in Europe and the United States the stocks at the end of 1930 were heavier than at the beginning of 1926, the real increase in consumption in the non-producing countries is only a little above 30 % ; in any case it is considerably less than that of production.

For the producing countries there are no statistical data available that allow of a complete or sufficiently exact estimation of their consumption. However, given the

preponderant importance of consumption in the importing countries there are grounds for believing that conclusions based on the figures relating to the latter countries may be considered as of general value.

Besides, the disproportion between production and consumption is clearly demonstrated by the movement of stocks. According to the data available, which includes stocks in Brazil and visible stocks in Europe and the United States, the quantities of coffee existing at the beginning of each commercial year (1 July) in the last five years underwent the following changes:

Stocks on 1 July.
(in thousand pounds)

	Brazil	Europe (1)	United States (1)	Total
	—	—	—	—
1927	(2) 661,000	267,000	172,000	1,100,000
1928	2,004,000	375,000	183,000	2,562,000
1929	1,426,000	362,000	148,000	1,936,000
1930	3,338,000	316,000	159,000	3,813,000
1931	2,815,000	423,000	252,000	3,490,000

The total of stocks in the four last seasons has increased by about 2,300 million pounds so that, in this period, the excess of production in relation to consumption has averaged almost 600 million pounds a year. The quantities of old crop existing on 1 July, 1931 corresponded approximately to the needs of the importing countries during the whole year.

The situation has become the more serious since the 1931-32 crop in Brazil is reported to be very abundant. According to the first estimates it is about 3,320 million pounds.

On the basis of a probable export in 1931-32 of about 2,100 million pounds it is considered that stocks in Brazil may reach on 1 July 1932 about 4,000 million pounds, the highest figure so far recorded.

Prices, which, thanks to the efforts of governmental authorities in Brazil, to the regulation of arrivals at the ports and to the financing of stocks, had up to October 1929 remained fairly stable at a relatively high level, have undergone a depression since that date owing to the exceptional abundance of the 1929-30 crop and the heavy production in 1931-32, now added to the very large stocks.

Other causes — the general economic depression, the depreciation of the milreis — have contributed to render the crisis more acute.

According to the quotations of No. 4 coffee at Santos at the beginning of each month and taking into account the variations of exchange between the milreis and the dollar, an average price of about 17 ½ dollar-cents per pound is obtained for the period January 1926 to October 1929, despite the fall of prices from October 1926 to October 1927 in relation to the forecast of an abundant crop in 1927-28. During the 24 months follow-

(1) Visible stocks. — (2) Figure partly estimated.

ing October 1929 the steady fall in prices brought them in October 1931 to the level of about 3 ½ dollar-cents per pound, that is, one fifth of the average price of 1926-29.

Price of No. 4 coffee at Santos.
(reduced to dollar-cents per pound)

Period	Minimum	Maximum	Average
January-September 1926	17.15	19.75	18.14
October 1926-October 1927	11.25	16.05	14.15
November 1927-October 1929	17.35	20.85	19.30
November 1929-March 1930	11.75	15.05	13.25
April 1930-September 1930	8.85	12.35	10.40
October 1930-March 1931	5.85	10.10	7.40
April 1931-September 1931	4.35	6.30	5.50
October 1931	—	—	3.55

In face of the situation so created the Brazilian government authorities have taken a series of measures with a view to diminishing the disproportion between stocks of coffee and world demand and consumption. They propose on the one hand to reduce stocks and avoid the further growth of production and on the other hand to encourage the development of consumption. Under the first group of measures come in the first place those relating to the purchase and destruction on the part of the National Coffee Council of a part of the surplus: toward 20 October the quantity so eliminated exceeded 220 million pounds; according to the projected financial programme it was hoped to eliminate in the very near future a total of 530 million pounds. At the same time the transport and sale of coffee of inferior quality, below type No. 8, has been forbidden. Finally, the creation of new coffee plantations is practically prohibited for a period of four years by means of a tax of one milreis for each new tree (excepting only those planted to replace old trees in the districts that are almost exhausted).

The measures in view for the development of consumption include assistance to the Coffee Institute for propaganda, agreements with importing countries with a view to obtaining a reduction of tariff duties, repression of fraud, improvement in quality and drying of the product.

Some idea of the possibilities of expanding the consumption of coffee may be obtained from the following table, in which are calculated, on the basis of figures of average net import and population toward the middle of each period, the average annual consumption per capita in the most important importing countries, in the five-year periods 1909-1913, 1921-25, and 1926-30.

Consumption of coffee in the most important importing countries.

	Total annual consumption (in thousand pounds) Average of the years			Annual consumption per capita (in pounds) Average of the years		
	1909-13	1921-25	1926-30	1909-13	1921-25	1926-30
United States .	857,600	1,288,400	1,469,200	9.0	11.7	12.3
France	245,800	369,300	364,600	6.2	9.3	8.8
Germany . . .	399,500	143,300	293,200	6.2	2.4	4.6
Italy	58,200	102,500	101,200	1.8	2.6	2.4
Sweden. . . .	74,300	87,100	93,700	13.4	14.6	15.4
Belgium . . .	78,000	85,500	90,800	10.4	11.2	11.5
Netherlands. .	94,400	78,000	75,800	15.7	10.8	9.9
Denmark . . .	32,000	48,100	56,700	11.7	14.3	16.1
Argentina. . .	28,200	46,500	54,000	3.7	4.9	4.9
Spain	29,300	47,200	51,100	1.5	2.2	2.2
Finland. . . .	28,700	33,700	38,400	9.0	9.7	10.6
Great Brit. and Ireland . . .	23,600	27,800	37,700	0.4	0.7	0.9
Norway	28,900	34,800	36,400	11.9	12.8	13.0
Switzerland . .	24,500	29,100	29,100	6.4	7.5	7.3
Union of South Africa	25,800	30,200	28,200	4.4	4.2	3.5
Canada. . . .	12,600	20,500	26,900	1.8	2.2	2.9
Algeria	16,800	19,600	23,400	3.1	3.3	3.7
Total	2,058,200	2,491,600	2,870,400	5.7	6.4	7.1

The total consumption of the above 17 countries, which in the last five-year period represented over nine-tenths of the total world import, has increased from before the war to 1921-25, that is, in twelve years, by about 21 %, and from 1921-25 to 1926-30, that is, in five years, by 15 %. The average consumption per capita in the last five-year

period is almost everywhere considerably above that of pre-war and in the majority of cases it is still growing in relation to the preceding five-year period. Even if account is taken of the fact that the figures of average consumption per capita in 1926-30 in certain countries are slightly exaggerated by the fact that, stocks in these countries having increased from 1926 to 1930, a certain part of the imports has not entered into real consumption, there is no doubt that average individual consumption for the total of the countries concerned has increased in nearly the same measure in the twelve years that separate the two periods 1909-13 and 1921-25, and in the five years that separate the periods 1921-25 and 1926-30, so that the rhythm of growth has been relatively much more rapid in the more recent years.

Any forecast of the development of consumption in the near future would be hazardous. It is certain that possibilities of expansion exist, both in the countries where consumption per capita is already relatively high and in those where it is still very low. The low prices may have a powerful effect in the realisation of these possibilities. Still it must be equally kept in mind that in many importing countries the high customs duties partly reduce the benefits of the fall in prices and that on the other hand, the present economic difficulties, which have reduced the purchasing power of the populations in a large part of the world, tend to restrict consumption, especially of commodities that are not of prime necessity.

* * *

Mexico : Crop condition is good in the principal producing regions. Harvesting has already begun and has given satisfactory yields.

Kenya : The September estimate of the coffee area in the present season is 99,300 acres against 96,600 in 1930-31 and 76,600 on the average for the preceding quinquennium (102.8 % and 129.7 %). Production is 189,000 centals against 311,000 in 1930-31 and 208,000 on the average (60.7 % and 90.9 %). As the percentage of coffee of low specific weight ascertained for the part of the crop already picked is very high, it is doubtful whether the total production will actually reach the figure indicated.

Cacao.

Gold Coast : The lack of sunshine delayed both ripening and harvesting of the major crop, growers having been reluctant to pick until there was promise of good drying weather. During the first half of October, however, with a break in the adverse weather, harvesting became general and at the beginning of November the pods were reported to be ripening quickly while prospects of harvesting during the month were regarded as normal. Despite unfavourable beginnings it is expected that the bulk of the crop will be ripe at almost the normal time. In Ashanti about 50 per cent. was expected to be ripe by the end of November, in the Eastern Province about 70 per cent. in the south and 50 per cent. in the north and in the Central Province similar proportions, but in the Western Province only 40 per cent. Yields are generally lighter than last year, particularly in Ashanti and on the older farms and heavier soils of the low-lying land along the Birim in the Eastern Province; in the Central Province, however, especially in the north, they are higher than last year and well up to normal. The following are the estimated totals for the major crop in the different provinces, amounting in all to 414.4 million lb.

	1000 lb.
Eastern Province.	172,500
Ashanti	134,400
Central Province	85,100
Western Province	22,400

Delay in first pickings was also encouraged by the using market as the chance of gain in price by waiting seemed greater than the possible loss due to over-ripe pods; rising prices also to some extent kept back marketings of the harvested pods, though in some localities a decrease in prices quickened selling. A large increase in the amount marketed was expected in the first half of November. There is no evidence of prepared cacao being held up and movement toward the ports is noted in most districts. In the Western Province pickings are particularly sensitive to price movements, owing to the relatively high transport charges due to distance from the railway, and the output above estimated for that province may not be attained. Given normal marketing conditions the estimated total output of 414 4 million lb. for all provinces is equivalent to exports for October-May inclusive.

The carryover from the minor crop this year is small, practically none remaining in the hands of the grower. The cacao exported in September consisted largely of the end of the minor crop and its purity was the lowest recorded for any month in the 1930-31 crop year, mould and slate being the predominant defects.

Some of the first lots of the major crop coming in showed but a slight improvement over September. There was a high percentage of over-ripe pods, harvesting having been delayed by the continued dull weather, and this rendered preparation difficult. The better weather subsequently prevailing effected an improvement, however, in the purity of the cacao coming in during the latter part of the month.

The following were the shipments during October, the first month of the 1931-32 season :

	October 1931	Average October last 4 years
Shipments per steamer (1000 lb.)	12,540	27,552
Arrivals by rail at Takoradi and Accra (1000 lb.)	11,648	26,432

Groundnuts.

Argentina : Sowing of groundnuts was effected under good conditions, especially in the province of Entre Rios where the soil had been very well prepared.

United States : Production of groundnuts for nuts is now estimated at 1,001 million lbs. showing a considerable increase on the October estimate; production was 726,745,000 lbs. in 1930 and 795,784,000 lbs. on the average for 1925-1929; percentages : 137.7 and 125.8.

India : In Madras Presidency condition of the groundnuts at the end of October was fair. Harvesting is in progress in Bombay Presidency.

Egypt : The crop is being uprooted. Its condition is normal. On 1 November it was 100 against 99 on 1 October and 100 on 1 November 1930.

Colza and Sesame.

Austria : Crop condition of colza on 1 November was considered 2.6 against 2.4 at the same date last year.

Hungary : Colza has developed uniformly and at the beginning of November was making good progress.

Mexico : Crop condition of sesame is good and it is forecast that the coming crop will exceed that of last year by about 40 %.

India : According to a report of October 22 the condition and prospects of the Indian sesame crop were good except in Burma, where they were disappointing.

Palestine : Threshing of sesame is over.

Tobacco.

Belgium : The tobacco leaves have been cured under excellent conditions.

Bulgaria : Harvesting is over.

Tobacco.

COUNTRIES	AREA					PRODUCTION				
	1931	1930	Average 1925 to 1929	% 1931		1931	1930	Average 1925 to 1929	% 1931	
				1930	Aver.				1930	Aver.
	1,000 acres					1,000 pounds				
*Germany	26	23	21	112.1	119.8	...	46,409	44,112	...	...
Belgium	7	7	7	100.0	97.2	12,739	15,387	15,334	82.8	83.1
Bulgaria	77	78	83	98.3	92.8	54,785	52,826	60,580	103.7	90.4
*Greece . . . . .	...	195	221	...	...	98,767	152,660	137,965	64.7	71.6
Czechoslovakia . .	22	18	14	125.7	157.4	27,778	22,095	16,342	125.7	170.0
*U. S. S. R.	406	243	210	164.0	193.6	—	—	—	—	—
*Canada . . . . .	...	41	37	...	...	48,230	36,717	34,774	131.4	133.7
United States . . .	2,096	2,117	1,787	99.0	117.3	1,648,000	1,641,437	1,357,127	100.4	121.4
Japan	91	89	91	102.7	100.8	155,757	145,175	142,157	107.3	109.6
Syria and Lebanon .	22	10	7	220.3	295.0	13,889	6,960	4,959	199.6	280.1
Algeria	40	57	65	68.9	60.6	20,283	48,486	54,283	46.6	37.4
*Tripolitania	1	1	—	83.2	—	132	1,543 (1)	243	8.6	54.5
Totals . . .	2,355	2,376	2,054	99.1	114.7	1,933,231	1,927,366	1,650,732	100.3	117.1

* Countries not included in the totals. — (1) Average 1927 and 1928.

Hungary : At the end of October tobacco picking was completed. Yields are average in quantity and quality.

Argentina : The Government of the Province of Tucumán has begun to distribute tobacco seed gratuitously amongst the farmers in order to extend the cultivation of this crop in the Province, where conditions are very favourable to its growth.

Canada : The following are the preliminary estimates of production of the different types of tobacco grown in Canada this year compared with the figures for previous years.

	1928	1929	1930	1931	% 1931 1930 = 100
	(Production in 000 lbs.)				
Burley	16,787	7,806	13,300	18,400	138.8
Bright flue-cured . .	8,726	10,500	12,451	21,170	170.0
Dark air-cured . . .	2,422	400	410	350	85.4
Dark fire-cured . . .	4,219	2,600	2,357	610	25.9
Cigar	5,198	5,004	5,320	5,260	98.9
Large pipe	2,810	2,610	2,030	1,770	87.2
Small pipe	609	770	671	610	90.9
Other types	195	196	178	—	—
Total	40,966	29,886	36,717	48,230	131.4

These preliminary figures show a remarkable development in the production of the bright flue-cured and burley varieties, continuing the tendency noted last year. All other types show decreases, especially dark fire-cured, production of which has dropped to a very low level compared with previous years.

At the present moment, figures of area are not available.

United States : Weather conditions during September were generally favourable for the development of late tobacco and unusually favourable for harvesting and curing of the early crop, which was nearly completed by the beginning of October in the main producing areas.

Japan : Quality of the tobacco is fairly good this year. Curing has been finished.

Palstine : Harvesting and drying of the leaves is over. Yields in Northern Palstine are good.

Algeria : Harvesting was completed under good conditions and the crop is of good quality.

Hops.

Great Britain and Northern Ireland : In England, although the area under hops in 1931 was smaller than in 1930, the area picked was 17,900 acres against 16,500 last year. The total production was, however, less than in 1930, due to a unit yield very much below that of last year and that for the ten years 1921-30. The best unit yields were, with one unimportant exception, obtained in Kent, where almost exactly two-thirds of the crop is produced, though yields in this county were also very inferior. The season this year was unsatisfactory as a whole, the weather having been unfavourable and downy mildew and insect pests having been exceptionally prevalent in most districts. The quality of most of the crop was moderate

Hungary : At the end of October harvesting of hops was over. Both unit yields and quality are average.

Hops.

COUNTRIES	AREA					PRODUCTION				
	1931	1930	Average 1925 to 1929	% 1931		1931	1930	Average 1925 to 1929	% 1931	
				1930 = 100	Aver- age = 100				1930 = 100	Aver- age = 100
1,000 acres					1,000 pounds					
*Germany	25	32	36	79.6	70.5	...	24,366	16,111	...	...
Belgium	3	3	3	100.0	73.9	2,271	2,961	5,118	76.7	44.4
England and Wales .	20	20	25	97.7	79.6	18,928	28,336	34,568	66.8	54.8
Czechoslovakia . . .	30	38	36	79.6	85.2	24,725	32,464	21,520	76.2	114.9
United States . . .	21	20	23	105.5	89.8	25,300	23,447	31,383	107.9	80.6
Totals. . .	74	81	87	96.6	85.3	71,224	87,208	92,584	81.8	76.9
* Countries not included in the totals.										

* Countries not included in the totals.

Sericulture.

Official data and information from private sources referring to the principal sericultural countries show that world production of cocoons in the current season is the smallest for the last five years ; the increasing difficulties recently encountered by rearers of silkworms and by spinning establishments, which have induced the Governments of several countries, as, for example, China and Japan, to intervene on their behalf by means of loans, are well known ; to these difficulties of a general character has this year been added a great shortage of mulberry leaves ; the generally unfavourable meteorological conditions have contributed to retard rearings considerably.

Relatively the heaviest reductions have been recorded in Europe. The first estimate for Italy does not in fact reach even 76 million pounds of cocoons and indicates a reduction of more than one-third on the production of 1930. In Bulgaria the production of cocoons slightly exceeds half that of 1930. In France, Hungary, Turkey and Rumania the season has been equally bad and it is estimated that their total production is only little above half that of last year.

In Yugoslavia also a great many sericulturists have given up rearing owing to low prices, which are no longer sufficiently remunerative.

Sericulture.

COUNTRIES	QUANTITIES OF EGGS PREPARED FOR INCUBATION					PRODUCTION OF COCOONS				
	1931	1930	Average 1925 to 1929	% 1931		1931	1930	Average 1925 to 1929	% 1931	
				1930	Aver.				1930	Aver.
	1,000 ounces			= 100	= 100	1,000 pounds			= 100	= 100
Bulgaria	20	44	40	45.8	50.4	2,646	4,995	4,338	53.0	60.3
Italy	701	946	993	74.1	70.6	75,968	116,250	109,297	65.3	69.5
Korea s)	222	225	185	98.6	120.2	27,605	23,404	19,953	97.2	138.4
Japon f)	2,507	2,790	2,560	100.6	109.6	435,419	463,825	356,033	93.9	112.8
Syria and Lebanon.	2,035	3,339	3,537	87.9	83.0	332,562	416,356	371,804	79.9	89.4
	81	106	96	78.7	84.6	6,206	8,047	6,844	77.1	90.7
Total . . .	6,766	7,450	7,411	90.8	91.3	880,406	1,637,886	898,319	84.8	98.0

s, Spring cocoons. — f) Summer-autumn cocoons.

In Japan, where rearings have increased from year to year and where last year's production was a maximum, the decrease in quantity of eggs placed in incubation and the unfavourable meteorological conditions have caused production to decrease by about 13 % in relation to that of 1930, falling back to the figure of 1928. In this country the output of summer-autumn cocoons is particularly low (20 % less than in 1930 and 10.5 % below the average); in this connection it may be recalled that the Ministry of Agriculture and Forests invited the rearers in June heavily to decrease the quantity of silkworm eggs placed in incubation.

In Korea spring production, which alone is at present known and which represents about two-thirds of the total production, is 3 % below the production of 1930.

As regards the other Oriental countries it is known that in Syria and Lebanon and in Persia production is one-third smaller, while in China a production 20 % less than in 1930 is indicated.

The American market, toward which is directed the main current of Japanese, Chinese and Italian exports and which in consequence forms the basis of the world market, has this year absorbed larger quantities of silk than last year; in fact the imports of raw silk into the United States in the first eight months of 1931 rose to 50 million pounds against 42 in the corresponding period of 1930. Japan and China met 90-95 % of the American demand, Italy about 5 % and other countries a very small proportion. An examination of the details of the imports into the United States shows that this year in the above-mentioned period there was a considerable increase in imports of raw silk from Japan, which is perhaps not unrelated to the intensive campaign that has been developed at great expense by the largest organisations concerned. It is calculated that in the period from January to June 1931 the United States imported in all from Japan 41 million pounds of raw silk (82 % of the total) against 32 in January-August 1930 (76.2 % of the total), while the imports from China were 6.5 million against 7.2 (12.8 % against 17.1 %) and from Italy 2.3 million against 2.7 (4.6 % against 6.3 %); in consequence there has been a large use of Japanese silk by American manufacturers, to the detriment of Chinese and Italian silk. This phenomenon is especially marked with respect to Chinese silk, the price of which should have been particularly affected by the steady depreciation of silver.

In Europe the largest importer of raw silk is France, which comes second only to the United States as an importer; French production is very small and insufficient to supply the needs of the large silk manufacturing industry and, despite the assistance

several times given by the Government to rearers, has in fact shown a great decrease : production of cocoons which in 1927 was 8.2 million pounds, fell in 1928 to 6 0, in 1929 to 5.5 and in 1930 to 4.0 ; for the current year it is estimated to be still lower, about 2 million pounds. Imports of silk also show a very considerable contraction in 1930 (10.6 million pounds) not only in comparison with the pre-war period (the average, of 1909-13 was about 17 million) but in comparison the three-year period 1927-29, which averaged 14.1 million pounds. As regards the current year it is known that from January to August France imported 6 2 million pounds in comparison with 5.7 in the corresponding period of 1930 : as is known, the French industry prefers Chinese and, to a less degree, Italian silk, and, least of all, Japanese silk.

As regards prices there are published in the following table the monthly means at New York for two typical qualities, Japanese Grand Double Extra and Italian Exquis.

		Dollars per lb.	
		Japanese G. D. E.	Italian E.
January	1931	3.25	3.14
February	"	3.12	3.13
March	"	2.91	2.90
April	"	2.74	2.77
May	"	2.60	2.30
June	"	2.48	2.25
July	"	2.79	2.46
August	"	2.70	2.52
September	"	2.74	2.47
October	"	2.60	2.45
1st half of November	1931	2.55	2.37

Prices, which had already fallen considerably in 1929 and 1930 (it is estimated that at the end of 1929 they were 16 % below the level of the beginning of that year and that from January to December 1930 they experienced a fall of about 40 %), have this year experienced a further reduction and the reaction noticeable in July for Japanese silk and in August for Italian, was not maintained.

The poor production this season ought to have a favourable influence on silk prices during the coming months ; the market situation will depend closely on the decisions of the Japanese Government regarding the stocks of silk accumulated during the past season in the attempt to stabilise prices, stocks that are at present estimated at about 100,000 bales.

FODDER CROPS

Austria : At the beginning of November lifting of mangolds began. Yields are relatively good though the bulbs have not reached their normal size. The growth of fodder crops, which at this period were still in the fields, has been retarded by frequent night frosts. Towards the middle of October the growth of grass on permanent meadows was very poor. In the plains permanent meadows still provided sufficient feed for livestock, while in the more elevated areas the grass was rapidly consumed, and some anxiety was aroused owing to the moderate supplies of feed other than concentrates. The growth of pastures is also constantly diminishing.

On November 1 the condition of fodder crops reported at this period was as follows : mangolds : 2.6 (against 2.4 on October 1 this year and 2.3 on November 1, 1930) ; red clover : 2.8 (2.8, 2.4) ; alfalfa : 2.6 (2.8, 3.0) ; mixed clover : 2.7 (2.7, 2.4) ; mixed fodder and vetches : 2.8 (2.9, 2.6) ; permanent meadows : 2.8 (3.0, 2.5) and pastures : 3.2 (3.2, 2.7).

Production of the principal fodder crops compared with the corresponding figures of last year and the preceding four year period are as follows :

		1931				1930	Average	% 1931	
		1st cutting	2nd cutting	3rd cutting	Total	Total	1926-29 Total	1930 = 100 %	Average = 100 %
Mangolds		—	—	—	30,909	38,949	35,201		
	(000 sh. tons)	—	—	—	1,545	1,947	1,760	79.4	87.8
Red clover (hay)		5,313	4,784	4,453	14,550	14,229	17,048	102.3	85.3
	(000 sh. tons)	266	239	223	728	711	852		
Alfalfa (hay)		2,249	1,786	1,477	5,512	3,982	4,120	138.4	133.8
	(000 sh. tons)	112	89	74	275	199	206		
Mixed clover (hay)		2,998	2,690	2,249	7,937	5,758	5,007	137.8	158.5
	(000 sh. tons)	150	134	112	396	288	250		
Permanent meadows capable of one, two		44,578	18,739	3,263	66,580	70,374	74,400	94.6	89.5
	(000 sh. tons)	2,229	937	163	3,329	3,158	3,720		
Vetches, green fodder		1) 1,168	2) 578	—	1,746	1,991	2,103	87.7	83.0
	(000 sh. tons)	1) 58	2) 29	—	87	100	105		
Maize, green fodder		1) 1,720	2) 529	—	2,249	2,269	2,202	99.1	102.1
	(000 sh. tons)	1) 86	2) 26	—	112	113	110		

1) First sowing. — 2) Second sowing.

Sugar-beet tops this year provide abundant fodder and somewhat alleviate the shortage of other fodder crops.

Belgium : Favoured by the fine weather, lifting of fodder roots has been effected under excellent conditions. Meadows and fields sown to clover and alfalfa look well.

Irish Free State : Weather during October, which was dry and genial was exceptionally favourable for root crops, though the mangel and turnip crops are expected to yield rather less than the average. Hay yielded an abundant crop of average good quality.

Finland : According to a recent revision, production of the principal fodder crops is as follows :

		1931	1930	% 1931 1930 = 100
		—	—	—
Turnips	(000 centals) . . .	11,413	14,069	81.1
	(000 sh. tons) . . .	571	703	
Permanent meadows	(000 centals). . .	8,949	9,437	94.8
	(000 sh. tons) . . .	447	472	
Temporary meadows	(000 centals). . .	62,146	57,979	107.2
	(000 sh. tons) . . .	3,107	2,890	

France : Fine weather has permitted the lifting of mangolds under good conditions.

Great Britain and North-in Ireland : There was very little rain in October save at the end of the month in Northern Ireland ; while temperatures were on the whole mild, sharp night frosts were reported from England and Wales and from Northern Ireland. Root crops in England and Wales benefitted by the improved weather but in Scotland bulbing of turnips and swedes was unfavourably affected by the dry conditions as well as by the night frosts. On the whole the season has not been favourable for roots and yields will be under average in most parts of England and Wales, the estimated production of turnips and swedes being there 153,776,000 centals (7,588,800 sh. tons), a decrease of 13 % on that of 1930 and of 27 % on the average of 1925-29, while that of mangolds is 101,539,000 centals (5,077,000 sh. tons), decreases of 17 % and 27 % respectively. In Scotland crop condition of turnips and swedes on 1 November was 90, as also that of mangolds. Finger-and-toe was reported from several districts in Scotland, especially on low-lying ground. In England and Wales good progress in lifting is reported.

Though growth was in places checked by frost pastures were generally abundant.

The following are the areas under fodder crops in Northern Ireland in thousands of acres :

	1931	1930	Average 1925-29	% 1931 1930 = 100	% 1931 average = 100
	—	—	—	—	—
Turnips	36.4	40.2	43.8	90.5	83.1
Mangolds	0.9	1.1	1.2	81.5	77.0
Temporary meadows for hay .	237.3	238.2	234.1	99.6	101.4
Permanent meadows for hay .	231.8	239.8	234.8	96.7	98.7

Hungary : At the end of October mangolds showed an improvement after the rains which fell previously. Harvesting was in progress. Yields are average.

The new sowings of clover and alfalfa are developing very well. This autumn fodder crop production, except that of clover and alfalfa, has been poor.

Meadows and pastures show intense growth, providing in general sufficient feed for livestock.

Italy : Irrigation has been begun. Crop condition of meadows and pastures has considerably improved. Autumn-winter grasses are very well developed.

Lithuania : Weather conditions were unfavourable for fodder crops in the latter half of October due to the occurrence of early frosts.

Netherlands : Fodder supplies are generally quite adequate.

Switzerland : If, from the point of view of quantity, the production of fodder crops has been fairly satisfactory, quality leaves much to be desired due to adverse weather conditions. Autumn pastures are giving yields varying from average to poor ; moreover, as a result of frost and early snow, it has not been possible everywhere to utilise pastures.

Argentina : Condition of meadows and pastures is good. Water reserves are abundant. The recent rains have favoured the growth of alfalfa. — (Telegram of 17 November) : Pastures are in excellent condition.

Canada : The Canadian Government has cabled the preliminary estimates of area and production of fodder crops this year compared with the final figures for 1930 and the five-year average, as follows :

	1931	1930	1925-1929	% 1931 1930 = 100	Av. = 100
<i>Area</i>					
(thousand acres)					
Turnips, etc.	193	226	220	85.4	96.3
Fodder maize	425	426	473	99.7	89.8
Hay and clover	8,902	10,418	10,037	83.8	88.7
Alfalfa	748	744	807	100.5	92.7
<i>Production.</i>					
Turnips, etc. (ooo centals)	41,064	41,064	37,520	100.0	109.4
(ooo sh. tons)	2,053	2,053	1,876		
Fodder maize (ooo centals)	69,520	69,514	78,871	100.0	88.1
(ooo sh. tons)	3,476	3,476	3,944		
Hay and clover (ooo centals)	327,940	327,940	314,953	100.0	104.1
(ooo sh. tons)	16,397	16,397	15,748		
Alfalfa (ooo centals)	37,300	32,800	38,581	113.7	96.7
(ooo sh. tons)	1,865	1,640	1,929		

Quite considerable changes have been made in the estimates of production since last month ; those for turnips and alfalfa have been notably reduced whereas the figures for fodder maize and hay and clover have been raised. The present production estimates for turnips, fodder maize and hay and clover roughly equal last year's final figures for these products, while for alfalfa an increase of 13.7 % is recorded.

United States : Pastures and ranges on about November 6 remained dry and in serious need of moisture in the Southeast, parts of the Southwest, the Great Basin, and the central and northern Rocky Mountain areas. Elsewhere conditions were largely satisfactory, except locally. Condition of pastures on October 1 averaged 63.5 compared with 56.1 on the same date last year and an average of 79.3 during the previous ten years on October 1.

The quality of tame hay on November 1 was estimated at 84.8 compared with 85.6 at the same date of last year and 88.7 on the average for the period 1920-1929. Corresponding figures for wild hay are 75.7, 81.6, 88.7.

Egypt : Early areas in project lands (permanently irrigated) are sown and sowing was begun in basin lands as soon as the water receded. In ordinary areas it was in progress. The first cutting was being taken in Minia province. Germination and growth were satisfactory. Crop condition on 1 November was 100, as on the same date last year.

LIVESTOCK AND DERIVATIVES

Condition of livestock and dairy production.

Belgium : Production of fodder crops is more than sufficient to feed livestock. The health of livestock is very satisfactory.

Irish Free State : The supplies of hay on hand are much larger than usual and stocks of feeding-stuffs on the whole are sufficient for the season's requirements. Milk yields in October showed the usual seasonal decline.

France : Fine weather has permitted grazing of livestock thus economising dry fodder. In the sugar producing area a restricted quantity of pulp is available and more than the usual quantity of straw and fodder is being used.

Great Britain and Northern Ireland : Winter keep is generally abundant. Concentrated feeding-stuffs are more plentiful. Milk yields were normal in October. In Northern Ireland both store and dairy cattle were reported in good condition.

Netherlands : Milk production is almost equal to the autumn average.

Switzerland : As autumn pastures have not been fully utilised owing to the frosts and early snow, it has been necessary to feed livestock with dry hay at an earlier period than last year.

Argentina : The health of livestock is in general good. Cattle and sheep breeding results are normal. Only the animals used for heavy draught purposes are tired and in mediocre condition. All the others are well fed and present a good appearance. (Telegram of 17 November) : Health of stock is very good.

Brazil : In the following table are given the data of production of milk and dairy products in 1930, compared with figures for 1925.

Product		1930	1925
Fresh milk	(ooo Imperial gallons)	481,698	285,968
	(ooo American gallons)	578,476	343,422
Condensed milk	(ooo lbs)	11,601	—
Butter	(ooo lbs)	46,459	39,683
Cheese	(ooo lbs)	82,601	66,139

The largest increase recorded is that for milk, the other products also showing increases. This industry is today in full development and, especially in the more important producing States, such as Minas Geraes and South Rio Grande, every effort is being made to increase the milk capacity of the animals.

United States : The number of eggs laid per hen and pullet of laying age was 8.5 % greater on October 1 this year than for the same date last year and about 7 % above the average for that date. The increase in rate of laying was partly offset by a decrease in the size of flocks compared with last year, amounting to about 3 or 4 % in recent months. The number of eggs laid per bird has been higher than the five year average each month this year except April. This high rate of laying may be explained by the culling of unproductive hens, heavy feeding and a larger than usual proportion of wheat in the ration as well as the favourable season for growth.

The number of turkeys on farms on October 1 this year was about 2 % larger than at that date in 1930 but smaller than the number on October 1, 1929. The increase took place principally in the Pacific Coast States and Texas. Quality of the turkey crop this year is mostly unusually good.

A report issued by the Federal Farm Board on October 22nd recommended further culling of dairy herds as the number of milk cows is again increasing this year and threatens to result in overproduction of dairy products. The number of milk cows on farms on September 1, 1931 was 3.6 % larger than at the same period of 1930 and a further increase is expected to take place by January 1, 1932.

On November 6 livestock were holding up well except in the very dry areas where pastures and ranges were affected.

In the following table are given the data of production of the principal manufactured dairy products in 1929 in the United States compared with corresponding figures for previous years.

The principal feature of production in 1930 was the large decrease recorded for condensed and evaporated milk in comparison with the preceding year. Smaller decreases may be noted also for creamery butter, condensed or evaporated butter milk, and ice cream. All other products show increases, the most important being for cheese and powdered milk.

PRODUCTS	1926	1927	1928	1929	1930	% 1930/1929
	(000 lbs)					
Creamery butter	1,451,766	1,496,495	1,487,049	1,597,027	1,594,826	99.9
Total cheese	427,416	406,686	437,519	483,933	512,319	105.9
Of which :						
Whole milk cheese	335,915	307,777	335,253	370,314	389,834	105.3
Swiss cheese	20,883	18,141	16,718	19,406	26,393	136.0
Brick and Munster cheese	31,048	31,546	28,960	31,763	34,471	108.5
Cream and Neufchatel cheese	13,192	25,962	30,589	34,405	33,243	96.6
Total condensed and evaporated milk	1,733,504	1,853,722	1,918,427	2,206,648	2,114,448	95.8
Of which :						
Sweetened condensed, skimmed milk	148,771	145,345	156,089	204,107	161,063	85.7
Sweetened, condensed unskimmed milk	210,631	201,023	177,737	197,611	183,047	
Unsweetened, evaporated, skimmed milk	128,743	134,185	158,243 (1)	153,624	156,923	98.1
Unsweetened, evaporated, unskimmed milk	1,245,300	1,373,169	1,426,358	1,651,306	1,613,415	
Condensed or evaporated buttermilk	80,687	99,180	102,452	107,288	96,431	89.9
Dried or powdered buttermilk	31,378	38,435	45,502	54,215	67,031	123.6
Powdered whole milk	10,768	11,404	9,605	13,202	16,440	117.0
Powdered skim milk	91,718	118,123	147,990	207,579	259,991	125.2
Dried casein	16,953	18,033	22,151	30,537	41,819	136.9
Malted milk	20,673	22,113	21,128	22,850	22,691	99.3
Ice cream of all kinds : (in thousand Imperial gallons)	179,237	188,820	193,340	212,020	200,473	94.6
(in thousand American gallons)	215,248	226,756	232,185	254,618	240,750	94.6

(1) Incomplete figure excluding the production of case goods which averaged about 10 million lbs for the period 1926-28.

Union of South Africa : Cold winds at the beginning of September scorched the young grazing.

In Natal grazing was bad and very little green feed was available ; the water supply on many farms gave out and cattle died daily in large numbers. Native stock in Zulu land were in particularly low condition and a large percentage had already perished.

Conditions in the Orange Free State and Transvaal although by no means critical, were also causing some anxiety. Grazing was barely sufficient for sheep, which were still in fair to good condition, but poor for cattle, which had fallen off considerably. The more general practice of providing feed for stock during the winter assisted materially in combating short periods of drought and stocks of dry feed were still available on most farms on the Eastern Transvaal Highveld.

Shearing of the wool and mohair clips was general during September but was delayed in many cases in the northern areas until after the first good rains.

New Zealand : According to the returns obtained from woolbrokers, woollen-mills, freezing-works, wool-scouring works, shipping companies, Harbour Board stores, the New Zealand Railways Department and the great bulk of the farmers, stocks of wool held in the Dominion on 30 June 1931 were 88,147,000 lb., against 75,397,000 lb. on the same date in 1930 and 23,380,000 lb. in 1929. These figures make no allowance for the condition of the wool ; it is computed that the corresponding figures for wool in the grease are 95,500,000 lb., 81,500,000 lb., and 27,500,000 lb. The figures give some idea of the extent to which wool has been held back on account of low prices.

The dairying season ending 31 July 1931 closed with new record productions of both butter and cheese. Production of butter in 1930-31 was 1,940,629 cwt an increase of 1.8 %

on that of 1929-30, the previous record, which was 1,906,880 cwt. The monthly production figures for the year show that after the peak was passed in January the output declined considerably below the corresponding months of the previous season until May, when the adverse cheese situation caused a sudden stimulation of the butter side of the industry. The result was that in the three months May to July the quantities of butter received into the grading-stores was abnormally in advance of the previous year's record figures. In August, the opening month of the current season, a new record production for the month was registered, the figure being 19.7 % ahead of production for August 1930.

Despite a falling-off in monthly production figures toward the end of the season, cheese production in 1930-31, at 1,784,532 cwt., was also 2.3 % in excess of the 1929-30 record, 1,745,056 cwt. The movement in cheese in 1930-31 was the reverse of that in butter; the earlier months showed a great improvement over corresponding months of the previous season, but a gradual diminution set in until in March a decrease relatively to the production of March 1930 was observed, a relative decrease that attained abnormal proportions in the later months of the season, culminating in a 70.4 % reduction for the last month of the dairying year. The decision to abandon the manufacture of standardised cheese in 1931-32 is expected to release a much greater output of cheese in the near future, though in the first months of the new season there were no signs of recovery, output for August being still 62.8 % behind that of August 1930 and that for September 37 % less than for September 1930.

Expressed in terms of total butterfat production the dairying industry in 1930-31 exceeded the 1929-30 record output by 2.1 %.

Market conditions were extremely adverse throughout the year and both butter and cheese prices suffered severely. In the last week of August 1930 prices of New Zealand butter in London were 124/- to 128/- per cwt. and in the last week of July 1931 were 108/- to 110/- per cwt.; the corresponding figures for cheese were 71/- to 78/- and 60/- to 63/- per cwt. For both commodities prices had risen slightly from the June figures.

Livestock in Northern Ireland.

The totals of livestock in Northern Ireland as at 1 June 1931, completion of which was delayed by the outbreak of foot-and-mouth disease in County Down, are now available and are as follows, comparable statistics of preceding years being given.

Northern Ireland.

YEAR	Horses for agri- cultural purposes	Cattle			Sheep	Donkeys	Mules	Pigs	Goats
		Total	Cows in milk	Heifers in calf					
1931	86,485	680,428	236,873	22,598	793,257	7,775	224	235,569	44,981
1930	87,101	672,776	234,025	22,278	704,100	8,299	235	216,515	43,538
1929	85,805	699,989	245,924	18,136	654,589	8,691	254	192,058	50,960
1928	87,178	737,866	252,616	21,181	624,508	8,473	252	229,125	51,443
1927	88,754	697,339	243,793	21,490	600,349	8,519	261	234,235	52,770
1926	109,102	666,402	237,219	22,778	529,474	8,512	258	153,331	51,268
1925	111,906	667,142	236,664	12,849	484,067	8,567	274	112,412	48,423
1924	116,333	735,622	256,739	14,171	509,405	9,280	368	139,778	54,962
1923	122,326	747,618	263,163	16,683	468,971	9,971	385	195,789	57,890
1922	—	790,000	273,000	20,000	425,000	10,000	350	118,000	56,000

There has been a 1.1 % increase in the total for cattle, the numbers of which had decreased in each of the two preceding years; the increase this year is mainly due to an upward movement in: cattle under one year, which increased by 8,283 to 186,950 (4.6 %) following on the large increase last year of heifers in calf. There are also increases in milch cows (1.2 %), which have been decreasing since 1928 and in heifers in calf (1.4 %) which are at the highest level since 1926. Other classes of cattle have decreased, particularly those two years old and over (—4.9 %).

Sheep again showed a relatively large increase (12.7 %), attaining a new record for the sixth successive year. The increase of 12.5 % in ewes for breeding purposes promises further upward movement.

Pigs show an increase (8.9 %) for the second year in succession, though the 1927 maximum has not been quite reached; the increase in sows for breeding is particularly large (10.5 %).

Horses, with a decline of 0.7 %, showed a renewal of the downward movement that was interrupted last year.

YEAR	Thousands				
	Fowls	Ducks	Geese	Turkeys	Total
1931	7,637	572	133	336	8,678
1930	7,659	622	146	331	8,808
1929	7,136	599	157	417	8,309
1928	6,829	637	165	343	7,979
1927	6,759	672	162	304	7,898
1926	6,763	690	157	301	7,916
1925	5,741	613	131	249	6,733
1909-1913	5,082	724	175	292	6,273

The advance in poultry-rearing, which has been notable in the last few years, has not continued this year, all classes being fewer than in 1930. The smallest decline has been in ordinary fowl (—0.3 %), which thus still remain high above the 1929 level. Ducks have decreased by 8.0 %, a continuance of the fall that was checked last year. The decrease in turkeys, which began last year, is this year most marked (—11.7 %), while that in geese has continued.

Livestock in the United States.

For the three months, July to September, shipments of stocker and feeder cattle into the eleven maize belt States this year were about 13 % larger than the small shipments during these months in 1930 but were 5 % below the five-year average for the same period. Shipments in July and August were much larger than in the corresponding months of 1930 but fell off rather sharply during September; in fact the number of cattle inspected for shipment in September was 12 % smaller than in September last year and the second smallest for the month in the last ten years. Market supplies for September were therefore correspondingly reduced (by about 15 %).

During the three months there was a considerable increase in the proportion of shipments of steers weighing under 700 lb. and a decrease for all other cattle.

In nearly all States difficulties in financing feeding operations were reported. In the western feeding States, supplies of hay and feed grains were much smaller than last year. In Texas, however, feed grains and cotton seed production had been large and prices for these were relatively low.

Inspected shipments of stocker and feeder sheep and lambs for the same period July-September (about 1,150,000 head) were roughly 20 % larger than for the same months of last year and 6 % above the five-year average. September shipments were about average and 7 % larger than in the same month of 1930.

As for cattle, financing of feeding operations was the great difficulty and contract feeding was being encouraged between producers and feeders who where unable to purchase feeding stock.

Livestock in Chile.

In the September Crop Report were published the results of the Census of June 30th, 1930, compared with those of 1925. For cattle and sheep there is now available the following classification by sex and age, but for horses data classified according to sex are not available.

	Census 30-VI-1930 (Head)
CATTLE:	
<i>Under 1 year of age</i>	419,656
<i>From 1 to 2 years of age</i>	683,543
Bulls	30,320
Young bulls	367,090
Bullocks	19,647
Cows	266,486
<i>Over 3 years of age</i>	1,284,741
Bulls	29,042
Young bulls	96,310
Bullocks	428,859
Cows	730,530
SHEEP:	
<i>Under 1 year old</i>	1,636,553
Lambs	706,388
Ewe-lambs	930,165
<i>Over 1 year old</i>	4,626,929
Sheep	172,124
Wethers	404,369
Ewes	4,050,436
HORSES:	441,027
Colts	23,795
Horses	221,646
Mares	195,586

Livestock in Salvador.

In the following table are given the numbers of livestock in the Republic of Salvador, as returned by the census of May 1930, compared with the figures for 1908 :

	Census 1930 — (Head)	Census 1908 —
Horses	43,133	74,336
Asses	2,146	—
Mules.	21,090	—
Cattle	328,052	284,013
Sheep	—	21,457
Goats.	7,241	—
Pigs	355,157	422,980

It may be observed that for the three kinds for which comparable data are given in the census, there is an increase of 40,000 head only for cattle, whereas for horses and pigs, considerable decreases of respectively 31,000 and 67,000 head are recorded.

TRADE

COUNTRIES	SEPTEMBER				TWO MONTHS (August 1-September 30)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1931	1930	1931	1930	1931	1930	1931	1930	1930-31	1930-31

Wheat. — Thousand centals (1 cental = 100 lbs).										
<i>Exporting Countries:</i>										
Bulgaria	844	278	0	0	1,082	697	0	0	3,234	0
Hungary	1,030	591	0	0	1,684	1,426	0	0	5,247	0
Lithuania	0	4	0	0	0	9	0	0	545	0
Rumania									8,675	7
U S S R								(2)	64,560	—
Yugoslavia	1,023	456	0	0	3,633	1,576	0	0	3,247	0
Canada	8,602	16,691	9	4	15,748	27,278	20	4	137,150	79
United States	5,038	7,628	657	1,671	10,384	18,817	1,464	2,482	46,355	11,616
Argentina	3,902	1,799	—	—	6,989	3,704	—	—	71,563	—
Chile	0	115	0	0	0	298	0	0	428	0
India	4	448	0	172	98	1,448	176	245	2,216	6,581
Turkey	22	60	0	4	31	75	0	4	265	7
Algeria								(3)	5,315 (3)	540
Tunis	328	306	31	7	1,082	930	60	11	3,704	542
Australia	2,928	1,660	0	0	6,589	3,715	0	0	76,505	0
<i>Importing Countries:</i>										
Germany	1,843	7	1,490	2,676	1,874	9	2,540	4,650	265	18,805
Austria	0	7	408	425	0	60	755	626	86	5,315
Belgium	600	18	2,985	3,675	1,087	24	3,743	6,402	2,079	30,082
Denmark	7	11	1,111	351	7	11	1,508	559	85	4,877
Spain				(4)	0 (4)	0 (4)	0 (4)	0	4	0
Estonia	0	0	29	24	0	0	68	7	0	370
Irish Free State	0	0	714	545	0	0	1,413	1,299	18	6,435
France	0	82	3,888	3,554	2	924	5,546	5,847	966	46,606
Gr. Brit. and N. Ir.	18	46	18,197	12,450	56	141	31,378	21,469	688	124,551
Greece	0	0	1,836	1,197	0	0	2,304	2,284	0	14,233
Italy	13	2	498	3,748	13	2	1,087	6,524	18	50,116
Latvia	0	0	37	182	0	0	101	311	0	1,030
Norway	—	—	115	254	—	—	238	529	—	3,126
Netherlands	9	7	1,812	2,240	15	9	2,747	3,683	683	16,599
Poland	71	245	37	4	123	256	40	20	1,847	49
Portugal	—	—	95	9	—	—	384	57	—	1,216
Sweden	0	2	185	428	0	9	386	723	31	2,879
Switzerland	0	0	1,248	1,140	0	0	2,282	2,075	2	11,066
Czechoslovakia	0	2	1,288	615	0	2	2,255	1,209	4	7,079
Japan	—	—	725	489	—	—	1,459	915	—	15,311
Syria and Lebanon	—	—	—	—	(4)	33 (4)	44 (4)	0 (4)	7	137
Egypt	—	—	—	—	(4)	0 (4)	0 (4)	4 (4)	82	2
Union of South Africa	—	—	—	—	—	—	—	—	0	1,019
New Zealand	—	—	—	—	(4)	0 (4)	0 (4)	15 (4)	26	0
Totals	26,232	30,465	36,865	35,814	50,505	61,439	68,093	62,193	435,339	362,639
Rye. — Thousand centals (1 cental = 100 lbs).										
<i>Exporting Countries:</i>										
Germany	432	190	293	57	454	677	368	75	1,218	600
Bulgaria	205	110	0	0	397	192	0	0	1,418	0
Hungary	84	104	0	0	198	216	0	0	1,579	0
Poland	373	1,144	18	0	534	2,165	13	0	5,880	2
Rumania	—	—	—	—	—	—	—	—	1,239	0
Czechoslovakia	2	88	507	9	2	146	785	18	476	844
U. S. S. R.	—	—	—	—	—	—	—	(5)	11,023	—
Yugoslavia	0	—	0	0	0	—	0	—	0	4
Canada	271	7	0	0	353	30	0	0	1,171	0
United States	9	13	—	—	13	24	—	—	90	—
Argentina	—	—	—	—	(4)	51 (4)	53	—	922	—
Turkey	42	106	0	0	86	193	0	0	368	0
Algeria	—	—	—	—	—	—	—	(3)	35 (3)	0
<i>Importing Countries:</i>										
Austria	0	2	82	112	0	4	168	207	9	2,205
Belgium	75	4	216	117	90	9	487	273	126	3,739
Denmark	0	0	633	617	0	0	1,098	1,139	4	7,324
Estonia	0	0	0	11	0	0	0	30	0	194
Finland	0	0	61	157	0	0	123	291	2	1,570
France	0	0	97	112	0	0	152	205	0	1,378
Italy	0	0	15	64	0	0	20	128	0	547
Latvia	0	0	18	2	0	0	31	117	0	269
Lithuania	0	0	2	0	0	11	2	0	168	0
Norway	0	0	233	265	0	0	536	487	0	3,028
Netherlands	68	7	538	831	115	11	950	807	791	6,325
Sweden	0	0	22	103	0	0	57	165	4	620
Switzerland	0	0	11	20	0	0	20	85	0	174
Totals	1,651	1,773	2,736	1,782	2,293	3,691	4,764	3,962	26,376	23,547

COUNTRIES	SEPTEMBER								TWO MONTHS (August 1-September 30)		TWELVE MONTHS (August 1-July 31)	
	EXPORTS				IMPORTS				EXPORTS		IMPORTS	
	1931	1930	1931	1930	1931	1930	1931	1930	1930-31	1930-31	1930-31	1930-31
Wheat flour. — Thousand cents (1 cental = 100 lbs).												
<i>Exporting Countries:</i>												
Germany	2	20	13	15	4	77	37	40	128	238		
Belgium	7	15	7	22	11	29	18	35	216	281		
Bulgaria	110	18	0	0	132	22	0	0	220	0		
Spain					2 (4)	0 (4)	0 (4)	0	75	0		
France	573	558	26	75	1,421	970	66	128	7,350	569		
Hungary	154	498	0	0	249	928	0	0	4,008	0		
Italy	34	93	22	18	265	157	40	31	1,179	225		
Latvia	0	11	0	0	0	24	0	0	73	2		
Poland	64	62	0	2	58	84	0	4	615	24		
Rumania									425	0		
Yugoslavia	7	7	0	0	7	15	0	0	88	2		
Canada	1,091	1,440	4	4	2,114	2,670	7	11	13,113	49		
United States	1,389	2,767	0	0	2,643	5,172	0	0	23,164	2		
Argentina	192	220	—	—	313	853	—	—	2,044	—		
Chile	4	15	0	0	4	35	0	0	104	0		
India	66	106	0	0	132	176	0	0	1,014	2		
Turkey	0	2	0	0	0	4	2	0	29	11		
Japan	293	300	13	24	540	509	24	75	3,472	212		
Algeria								(s)	234 (3)	37		
Tunis	11	18	0	4	40	42	2	4	251	11		
Australia	2,524	602	0	0	3,371	1,733	0	0	10,404	0		
<i>Importing Countries:</i>												
Austria	0	0	64	159	2	0	70	225	13	3,100		
Denmark	2	2	126	145	4	9	281	269	24	1,572		
Estonia	4	0	2	11	4	0	7	22	2	88		
Irish Free State	2	9	317	313	7	13	617	626	40	3,686		
Finland	—	—	172	243	—	—	342	443	—	2,150		
Gr. Britain and N. Ir.	397	432	1,063	1,279	780	794	1,967	2,597	4,608	12,816		
Greece	—	—	9	20	—	—	18	42	—	165		
Norway	0	0	104	163	0	0	269	317	2	1,896		
Netherlands	4	11	71	302	7	24	174	644	115	3,845		
Portugal	—	—	24	9	—	—	37	26	—	218		
Sweden	0	0	4	9	0	2	7	26	2	71		
Czechoslovakia	0	0	148	370	2	2	172	558	11	2,432		
Ceylon	—	—	20	29	—	—	62	90	—	445		
Java and Madura	—	—	—	—	—	—	(4)	93 (4)	95	1,025		
Indo-China	—	—	53	40	—	—	79	77	—	428		
Syria and Lebanon	—	—	—	—	(4)	7 (4)	0 (4)	85 (4)	7	22		
Egypt	—	—	—	—	(4)	0 (4)	0 (4)	163 (4)	229	0		
Union of South Africa	—	—	—	—	—	—	—	—	11	265		
New Zealand	—	—	—	—	(4)	0 (4)	0 (4)	26 (4)	20	234		
Totals	7,030	7,404	2,364	3,319	12,161	13,904	4,579	6,641	73,058	39,279		
Barley. — Thousand cents (1 cental = 100 lbs).												
<i>Exporting Countries:</i>												
Bulgaria	139	227	0	0	207	445	0	0	1,598	0		
Spain	—	—	—	—	2 (4)	11 (4)	0 (4)	0	152	0		
Hungary	22	57	0	0	24	79	0	0	580	4		
Lithuania	0	2	0	0	0	7	0	0	15	0		
Poland	395	542	0	0	408	681	0	0	2,798	0		
Rumania	—	—	—	—	—	—	—	—	32,778	0		
Czechoslovakia	115	403	0	0	119	494	0	0	3,003	4		
U. S. S. R.	—	—	—	—	—	—	—	—	22,963	—		
Yugoslavia	4	2	20	24	9	0	20	35	29	130		
Canada	384	71	0	0	1,942	71	0	0	9,240	0		
United States	322	558	—	—	794	1,135	—	—	5,022	—		
Argentina	79	132	—	—	176	430	—	—	5,701	—		
Chile	0	31	0	0	37	104	0	0	536	0		
India	0	0	0	0	2	2	0	0	302	2		
Syria and Lebanon	—	—	—	—	(4)	24 (4)	51 (4)	2 (4)	0	899	7	
Turkey	187	44	0	0	324	62	0	0	593	0		
Algeria	—	—	—	—	—	—	—	—	(s)	1,378 (3)	225	
Egypt	—	—	—	—	(4)	0 (4)	0 (4)	42 (4)	9	2		
Tunis	7	60	60	26	108	112	88	71	220	390		
Australia	18	62	0	0	90	223	0	0	1,552	0		
<i>Importing Countries:</i>												
Germany	0	2	1,127	690	0	22	1,627	1,208	62	17,906		
Austria	0	0	238	267	0	0	309	351	0	2,077		
Belgium	75	15	1,001	776	146	29	1,530	1,177	1,076	10,538		
Denmark	7	20	388	902	7	20	1,120	1,642	1,232	15,007		
Estonia	—	—	0	2	—	—	—	—	2	13		
Irish Free State	0	0	7	2	0	0	7	4	20	454		
France	0	0	553	384	0	4	944	485	22	7,710		
Gr. Britain and N. Ir.	0	2	1,975	1,351	0	4	3,267	2,295	68	18,691		
Greece	—	—	0	7	—	—	—	11	—	79		
Italy	0	0	22	29	0	0	37	66	0	778		
Latvia	0	0	0	20	0	0	2	25	0	212		
Norway	0	0	93	119	0	0	93	128	0	1,078		
Czechoslovakia	9	18	961	1,528	15	37	1,638	2,099	561	19,716		
Ceylon	0	0	174	170	0	0	289	335	0	2,829		
Totals	1,743	2,276	6,619	6,387	4,432	4,632	10,395	9,582	32,405	92,699		

See notes page 720.

COUNTRIES	SEPTEMBER				TWO MONTHS (August 1-September 30)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1931	1930	1931	1930	1931	1930	1931	1930	1930-31	1930-31
Oats. — Thousand centals (1 cental = 100 lbs).										
<i>Exporting Countries:</i>										
Germany	0	37	20	7	0	159	115	11	220	1,005
Irish Free State	9	18	33	2	9	37	82	13	254	452
Hungary	0	2	0	0	0	4	0	0	13	141
Lithuania	0	4	0	0	0	35	0	0	84	0
Poland	2	11	0	0	4	64	0	0	137	0
Rumania									1,789	0
Czechoslovakia	57	139	4	2	75	196	49	4	710	143
U S S R								(5)	9,513	—
Yugoslavia	0	0	0	0	0	0	0	53	2	86
Canada	236	75	108	172	492	123	165	209	2,659	234
United States	101	4	0	0	172	40	0	0	130	193
Argentina	933	829	—	—	1,711	1,146	—	—	14,621	—
Chile	22	315	0	0	35	470	0	0	2,178	0
Algeria								(3)	1,036 (3)	126
Tunis	24	73	0	0	79	176	0	0	545	9
<i>Importing Countries:</i>										
Austria	0	0	90	152	0	2	181	240	2	2,227
Belgium	0	0	97	220	0	0	309	433	4	3,494
Denmark	7	0	73	24	11	0	179	101	20	1,270
Estonia	0	0	0	11	0	0	0	13	0	159
Finland	0	0	22	0	0	0	35	15	7	260
France	0	2	99	216	0	4	260	306	20	2,147
Gr. Brit. and N. Irel.	9	4	970	386	13	15	1,799	800	397	10,697
Greece	—	—	0	0	—	—	0	0	—	0
Italy	0	0	267	251	0	0	417	448	0	3,741
Latvia	0	0	2	4	0	0	2	9	4	57
Norway	0	0	22	0	0	0	62	0	4	4
Netherlands	4	2	260	121	9	9	348	324	375	3,609
Sweden	0	0	77	46	0	7	300	90	40	1,334
Switzerland	0	0	282	315	0	0	672	633	2	4,564
Australia	2	4	0	0	11	7	0	0	73	2
Totals	1,406	1,519	2,426	1,929	2,621	2,499	4,973	3,754	34,789	35,959

Maize. — Thousand centals (1 cental = 100 lbs).

COUNTRIES	ELEVEN MONTHS (November 1-September 30)				TWELVE MONTHS (Nov. 1-Oct. 31)	
	1930-31	1929-30	1930-31	1929-30	1929-30	1929-30
	(Nov. 1-Sept. 30)	(Nov. 1-Sept. 30)	(Nov. 1-Sept. 30)	(Nov. 1-Sept. 30)	(Nov. 1-Sept. 30)	(Nov. 1-Sept. 30)
<i>Exporting Countries:</i>						
Bulgaria	64	137	0	0	4,017	0
Hungary	0	9	132	29	3,351	132
Rumania				(1)	14,513 (1)	25,183 (1)
Yugoslavia	40	408	2	9	0,400	11,654
United States	55	179	4	196	1,224	4,173
Argentina	23,834	11,270	—	—	175,846	84,925
Brazil				(1)	18 (1)	311
Java and Madura	93	20	—	—	2,352	1,735
Indo-China	0	408	—	—	1,363	1,392
Syria and Lebanon . . . . .	...	...	...	(4)	152 (4)	395 (4)
Egypt . . . . .	...	...	...	(4)	4 (4)	20 (4)
Union of South Africa . . . . .	...	...	...	(1)	1,034 (1)	3,234 (1)
<i>Importing Countries:</i>						
Germany	0	0	1,133	657	0	0
Austria	0	0	758	300	2	18
Belgium	88	26	2,134	1,140	791	212
Denmark	0	0	1,554	388	0	0
Spain . . . . .	...	...	...	(4)	0 (4)	0 (4)
Irish Free State	0	9	1,146	1,292	26	29
Finland	—	—	84	20	—	302
France	0	0	2,894	2,011	37	44
Gr. Brit. and N. Ir.	193	205	4,967	4,054	2,163	1,892
Greece	—	—	13	7	—	362
Italy	0	0	2,097	1,303	7	7
Norway	—	—	542	190	—	3,649
Netherlands	13	22	3,336	2,141	265	613
Poland	0	0	22	18	0	4
Portugal	—	—	137	119	—	1,470
Sweden	—	—	915	134	—	6,501
Switzerland	0	0	443	284	2	0
Czechoslovakia	0	0	1,045	439	2	2
Canada	0	0	317	730	9	4
Japan	—	—	126	73	—	1,565
Tunis	0	0	2	0	9	2
Totals	24,385	12,693	23,953	15,534	210,337	143,148

(1) (3) (4) (5) See notes page 720.

COUNTRIES	SEPTEMBER				NINE MONTHS (January 1-September 30)				TWELVE MONTHS (January 1-Dec. 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1931	1930	1931	1930	1931	1930	1931	1930	1930	1930
Rice. — Thousand centals (1 cental = 100 lbs)										
<i>Exporting Countries:</i>										
Spain					(4)	476 (4)	725 (4)	0 (4)	1,252	0
Italy	148	276	11	13	2,154	3,137	46	128	4,716	134
United States	93	99	7	11	1,867	1,664	265	216	2,616	238
Brazil					(4)	1,482 (1)	487		844	
India	2,551	2,524	15	4	33,100	49,871	443	24	57,318	139
Indo-China	306	1,341			13,944	18,241			21,998	
Siam	1,446	1,567			18,417	16,643			20,598	
Egypt					(4)	525 (4)	721 (4)	302 (4)	1,206	251
<i>Importing Countries:</i>										
Germany	101	190	1,089	324	948	1,259	6,678	4,352	1,594	5,508
Austria	0	0	42	40	0	0	454	450	0	606
Belgium	22	0	137	51	184	7	1,069	809	9	1,047
Denmark	0	0	13	11	0	0	110	95	0	139
Estonia			2	4			26	20		35
Irish Free State	0	0	2	2	0	0	42	35	0	46
France	71	176	1,027	509	607	1,426	4,795	4,010	1,908	5,650
Gr. Brit. and N. Ir.	11	11	203	201	163	181	1,986	1,964	218	2,564
Greece			37	42			410	392		336
Hungary	0	0	9	44	2	7	337	194	9	388
Latvia	0	0	2	15	0	4	66	46	7	62
Lithuania	0	0	2	2	0	0	18	22	0	31
Norway			2	11			95	79		101
Netherlands	185	148	304	35	1,944	1,565	4,583	3,267	2,085	3,503
Poland	36	15	359	2	300	87	1,504	1,173	126	1,177
Portugal			53	71			467	714		941
Sweden			0	0			123	181		161
Switzerland	0	0	33	26	0	0	208	251	0	408
Czechoslovakia	0	0	60	134	0	0	778	787	0	979
Yugoslavia	0	0	46	44	2	2	353	300	2	516
Canada	0	0	11	15	0	0	569	487	0	584
Chile			40	33			439	439		518
Ceylon	0	0	840	805	15	7	7,763	8,278	9	10,809
Java and Madura				(4)	174 (4)	49 (4)	4,308 (4)	4,497	117	5,487
Japan	322	11	276	315	3,956	161	2,070	3,073	1,252	3,973
Syria and Lebanon			20	15	(4)	0 (4)	2 (4)	205 (4)	181	2
Turkey	0	0		(3)	0	2	187	134	2	203
Algeria			4	(3)	0 (3)	0 (3)	46 (3)	14	9	104
Tunis	0	0		2	0	0	28	15	0	24
Union of S. Africa				(1)	0 (1)	0 (1)	684 (1)	608	0	930
Australia	9	4	4	2	104	55	24	62	71	75
New Zealand				(4)	0 (4)	0 (4)	55 (4)	55	0	66
Totals	5,351	6,562	4,652	2,782	87,434	96,223	41,591	37,504	117,912	48,363

Linseed. — Thousand centals (1 cental = 100 lbs)										
<i>Exporting Countries:</i>										
Estonia	0	0	0	2	0	0	0	55	2	
Lithuania	2	33	0	0	130	88	0	448		
Argentina	3,457	1,601			33,515	19,582		25,466		
India	152	403	0	0	1,806	5,291	0	5,768	0	
Tunis	0	0	0	0	4	9	0	9	0	
<i>Importing Countries:</i>										
Germany	0	0	417	370	9	24	5,081	4,130	26	5,194
Belgium	15	4	300	77	84	57	2,901	1,164	68	1,876
Denmark			13	15			397	269		359
Spain						(4)	390 (4)	265		419
Finland	0	0	4	0	0	0	51	64	0	79
France	0	0	414	441	13	11	4,169	3,228	15	4,288
Gr. Brit. and N. Irel.	0	0	615	406	4	9	5,750	3,256	9	5,081
Greece	0	0	11	15	0	2	71	51	2	64
Hungary	7	53	0	0	31	115	2	106	143	106
Italy	0	0	82	82	0	0	1,014	754	0	1,175
Latvia	0	22	7	13	55	77	73	75	236	168
Norway			0	22			234	269		357
Netherlands	2	4	710	183	46	130	7,244	4,341	146	5,617
Poland	0	7	7	11	7	24	271	141	31	150
Sweden			99	53			910	659		798
Czechoslovakia	2	4	84	66	4	13	454	337	18	446
Yugoslavia	0	0	7	24	0	2	115	117	2	121
Canada	0	97	9	0	483	207	26	452	783	454
United States			1,382	33			6,486	6,069		7,090
Japan			7	7			149	80		126
Australia	0	0	13	24	0	0	262	259	0	340
Totals	3,637	2,228	4,181	1,842	36,193	25,583	36,896	26,734	33,215	34,059

(1) See notes page 720.

COUNTRIES	SEPTEMBER				NINE MONTHS (January 1-September 30)				TWELVE MONTHS (January 1-Dec. 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1931	1930	1931	1930	1931	1930	1931	1930	1930	1930
Butter. — (Thousand lbs.)										
<i>Exporting Countries:</i>										
Austria	439	401	22	2	1,872	2,048	1,534	516	4,112	545
Denmark	29,308	31,308	108	161	286,661	284,034	1,276	1,280	372,558	1,389
Estonia	3,997	4,442	0	0	25,172	23,354	0	0	31,010	0
Irish Free State	5,115	8,876	24	46	34,275	49,445	3,219	2,901	58,815	3,391
Finland	2,994	1,062	0	0	31,284	29,460	0	2	37,726	7
France	1,182	1,032	1,984	192	7,665	8,726	34,963	10,000	12,053	12,924
Hungary	655	553	0	0	1,922	2,427	117	40	3,430	40
Latvia	4,716	3,858	0	2	22,443	31,586	22	33	40,630	49
Lithuania	2,304	2,037	0	0	15,686	12,531	0	0	18,219	0
Netherlands	6,096	7,392	185	247	58,782	73,933	4,508	2,276	92,394	4,382
Poland	3,208	3,263	0	4	23,023	21,173	20	22	26,714	29
Sweden	3,470	4,718	9	0	34,375	45,354	15	15	58,557	18
U. S. S. R	—	—	—	(2)	18,052 (2)	9,893	—	—	23,149	—
India	1,817	2,039	—	—	30,455	32,825	—	—	51,156	—
Syria and Lebanon	29	29	22	18	254	403	245	196	551	282
Australia	30,494	7,619	0	0	1,195 (4)	1,532 (4)	192 (4)	82	2,191	172
New Zealand	11,327	9,147	—	—	142,884	72,508	0	2	126,411	2
					148,625	147,199	—	—	208,170	—
<i>Importing Countries:</i>										
Germany	22	35	18,512	27,386	236	500	159,860	216,780	578	293,560
Belgium	280	247	3,785	1,942	2,057	1,993	29,648	15,061	2,048	22,412
Spain	—	—	—	(4)	66 (4)	117 (4)	42 (4)	146	161	328
Gr. Brit. and N. Irel.	1,993	794	66,580	55,667	26,462	9,897	677,564	581,304	21,028	764,782
Greece	—	—	192	110	—	—	1,356	1,014	—	1,420
Italy	42	104	15	73	1,208	1,678	4,819	1,413	1,843	3,115
Norway	125	0	57	234	1,418	229	271	1,105	236	1,530
Switzerland	2	4	1,887	1,561	9	37	17,013	14,290	42	18,736
Czechoslovakia	62	9	280	88	366	465	3,516	648	694	714
Canada	1,664	157	0	877	7,584	833	2,818	35,884	1,179	38,605
United States	139	185	77	117	1,691	2,443	957	2,213	2,967	2,471
Ceylon	—	—	29	42	—	—	428	540	—	728
Java and Madura	—	—	—	—	—	(4)	5,767 (4)	5,509	—	7,557
Japan	—	—	13	26	—	—	165	496	—	611
Algeria	—	—	—	(3)	24 (3)	24 (3)	1,362 (3)	1,288	82	3,232
Egypt	—	—	—	(4)	24 (4)	11 (4)	1,548 (4)	1,684	13	2,417
Tunis	0	4	60	53	2	9	628	378	13	829
Totals	111,663	90,305	94,141	88,848	935,572	866,616	953,882	891,413	1,197,600	1,166,332
Cheese. — (Thousand lbs.)										
<i>Exporting Countries:</i>										
Denmark	873	1,195	46	68	7,024	9,751	450	525	12,626	809
Finland	467	600	4	2	4,570	3,347	20	22	4,083	35
Italy	9,617	6,444	1,175	1,473	64,540	56,804	7,954	9,667	80,965	12,562
Lithuania	232	183	2	0	1,554	1,424	9	7	1,960	11
Norway	410	117	46	66	1,896	895	408	494	1,380	750
Netherlands	16,619	17,902	123	141	144,478	156,745	932	1,082	206,739	1,510
Poland	209	311	71	79	2,116	2,247	582	783	3,267	1,074
Switzerland	5,730	6,576	897	269	44,335	50,810	5,093	3,051	66,146	4,251
Czechoslovakia	1,138	809	335	295	6,367	5,214	2,961	2,374	8,274	2,968
Yugoslavia	474	373	22	24	2,873	2,504	183	227	4,583	300
Canada	16,659	12,652	93	130	47,929	44,893	979	1,265	66,965	1,779
Australia	309	922	0	4	4,209	4,341	20	146	7,273	150
New Zealand	5,904	2,806	0	0	131,242	140,611	4	4	201,256	7
<i>Importing Countries:</i>										
Germany	694	397	10,634	12,427	4,930	3,777	90,438	104,402	5,410	137,459
Austria	719	353	403	381	4,702	2,560	4,696	4,562	4,482	5,637
Belgium	71	88	4,969	5,005	608	650	37,470	38,528	890	51,304
Spain	—	—	—	(4)	187 (4)	150 (4)	2,266 (4)	3,497	207	5,336
Irish Free State	22	26	278	190	99	110	1,903	1,793	194	2,360
France	2,399	2,798	3,514	5,798	23,867	29,055	61,436	45,519	38,921	66,060
Gr. Brit. and N. Irel.	588	701	21,958	26,200	5,393	6,702	234,643	257,772	8,927	348,552
Greece	28	68	247	121	143	238	2,493	1,020	262	2,302
Hungary	7	7	13	13	83	60	185	289	93	366
Portugal	—	—	57	154	—	—	516	624	—	1,010
Sweden	—	—	193	117	—	—	1,133	922	—	1,476
United States	123	126	5,516	4,332	1,385	1,631	43,561	51,707	2,127	68,313
India	0	0	62	86	2	2	602	761	7	1,183
Java and Madura	—	—	—	—	—	(4)	1,032 (4)	1,054	—	1,671
Syria and Lebanon	—	—	—	(4)	75 (4)	115 (4)	454 (4)	419	132	730
Algeria	—	—	—	(3)	77 (3)	79 (3)	2,826 (3)	3,948	212	10,397
Egypt	—	—	—	(4)	40 (4)	46 (4)	4,813 (4)	4,405	60	7,553
Tunis	2	0	183	121	22	18	1,368	1,215	29	1,746
Totals	63,970	55,454	55,961	57,497	395,640	524,783	511,484	542,864	728,650	746,240

COUNTRIES	SEPTEMBER				TWO MONTHS (August 1-September 30)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1931	1930	1931	1930	1931	1930	1931	1930	1930-31	1930-31
Cotton. — Thousand centals (1 cental = 100 lbs)										
<i>Exporting Countries:</i>										
United States	3 005	4 822	26	18	4 154	6 823	64	46	36,891	538
Argentina	104	57	—	—	152	134	—	—	511	—
Brazil	—	—	—	—	7 (4)	18	—	—	516	—
India	439	1,129	84	55	1,462	2,116	163	123	14,645	1,847
Egypt	—	—	—	—	70 (4)	152 (4)	0 (4)	0	6,669	0
<i>Importing Countries:</i>										
Germany	183	137	384	637	337	291	811	1,151	1,706	8,442
Austria	—	—	—	—	—	—	—	—	—	—
Belgium	0	0	37	31	0	0	71	71	0	467
Denmark	35	13	117	132	73	26	240	262	201	1,713
Spain	—	—	9	7	—	—	15	15	—	154
Estonia	—	—	—	—	2 (4)	2 (4)	55 (4)	126	24	2,253
Finland	0	0	7	4	0	0	11	15	0	84
France	0	0	7	15	0	0	29	28	0	172
Gr. Brit. and N. Irel.	60	62	146	425	110	115	333	750	549	8,142
Greece	31	44	432	573	64	112	1,054	1,065	481	10,959
Hungary	0	0	13	18	0	0	31	26	0	225
Italy	—	—	20	20	—	—	35	35	—	291
Latvia	0	0	216	190	0	0	430	375	2	3,821
Norway	0	0	4	7	0	0	9	15	0	62
Netherlands	—	—	0	4	—	—	2	7	—	46
Poland	2	2	64	68	2	2	139	128	7	1,043
Portugal	2	2	93	154	4	4	190	282	24	1,444
Sweden	—	—	24	20	—	—	53	33	—	333
Switzerland	—	—	29	23	—	—	77	64	—	467
Czechoslovakia	4	0	31	26	4	0	60	55	7	608
Yugoslavia	13	15	141	207	22	31	232	379	154	2,368
Canada	0	0	18	18	0	0	33	31	0	185
Japan	—	—	51	57	—	—	99	95	—	1,025
Algeria	84	51	1,177	397	84	84	1,903	829	584	13,757
Totals	3,962	6,334	3,130	3,112	7,182	9,910	6,189	6,009	62,432	60,448

Wool. — (Thousand lbs).

COUNTRIES	TWO MONTHS (September 1-August 31)				TWO MONTHS (September 1-August 31)				Twelve months (Sept. 1-August 31)	
	1930-31		1929-30		1930-31		1929-30		1930-31	1929-30
	1930-31	1929-30	1930-31	1929-30	1930-31	1929-30	1930-31	1929-30	1930-31	1929-30
<i>Exporting Countries:</i>										
Spain	1,138	703	77	44	3,946	8,062	10,474	5,767	—	—
Irish Free State	428	556	68	49	7,965	10,249	752	994	—	—
Hungary	—	—	—	—	6,931	10,013	1,612	1,556	—	—
Argentina	7,059	6,457	—	—	329,870	277,391	—	—	—	—
Chile	198	223	—	—	47,499	20,286	—	—	—	—
India	2,631	1,446	373	86	41,806	47,823	4,857	4,189	—	—
Syria and Lebanon	—	—	—	—	9,815	7,455	3,944	1,808	—	—
Algeria	—	—	—	—	10,715 (3)	6,023 (3)	578 (3)	699	—	—
Egypt	—	—	—	—	3,752	2,533	2	4	—	—
Tunis	18	18	57	99	461	553	800	1,118	—	—
Un. of S. Africa	—	—	—	—	269,016 (1)	283,253 (1)	33 (1)	0	—	—
Australia	44,276	39,505	9	165	4,687 (1)	7,013 (1)	500 (1)	284	—	—
New Zealand	772	5,463	0	0	749,742	738,152	2,387	2,887	—	—
Poland	4,312	4,709	0	0	43,923	47,375	53	664	—	—
<i>Importing Countries:</i>										
Germany	1,237	765	6,012	15,335	11,305	11,188	329,621	294,117	—	—
Austria	1,153	1,111	1,698	2,169	13,153	14,996	30,552	28,609	—	—
Belgium	20	7	395	558	254	866	14,149	15,655	—	—
Denmark	1,250	1,140	4,411	6,982	10,311	9,006	138,435	166,993	—	—
Finland	1,739	1,609	170	304	21,638	25,946	3,918	4,945	—	—
France	4	7	227	315	93	130	3,591	3,413	—	—
Gr. Britain and N. Ir.	2	0	163	212	84	84	2,328	1,929	—	—
Greece	4,742	3,858	10,384	21,363	51,606	55,934	479,342	545,338	—	—
Italy	6,341	9,526	29,103	25,565	309,823	333,774	821,498	779,872	—	—
Norway	0	110	225	201	892	659	3,025	2,714	—	—
Netherlands	180	207	4,838	6,837	2,161	1,980	96,636	95,006	—	—
Poland	236	101	1,206	873	4,967	2,685	9,599	13,109	—	—
Sweden	62	79	152	139	725	968	1,598	1,855	—	—
Switzerland	157	187	538	88	2,394	2,112	8,770	10,532	—	—
Czechoslovakia	20	24	483	337	388	527	7,134	6,257	—	—
Yugoslavia	379	155	853	2,169	2,610	3,338	33,258	34,743	—	—
Canada	—	—	977	994	—	—	15,461	15,741	—	—
United States	62	0	542	622	366	55	18,922	19,178	—	—
Japan	176	148	1,786	2,705	1,590	2,273	36,952	36,149	—	—
Algeria	0	0	225	846	24	84	7,963	6,676	—	—
Egypt	99	597	366	525	2,271	6,101	12,017	9,778	—	—
Tunis	130	75	11,676	8,816	2,224	2,198	153,041	203,639	—	—
Algeria	13	0	6,943	5,809	42	24	142,256	100,900	—	—
Totals	82,778	82,332	83,750	163,577	2,185,966	2,150,561	2,404,936	2,420,171	—	—

a) = Wool, greasy; b) = Wool, scoured.

(1) (3) (4) See notes page 720.

COUNTRIES	SEPTEMBER		THREE MONTHS (July 1-Sept. 30)		TWELVE MONTHS (July 1- June 30)	COUNTRIES	SEPTEMBER		THREE MONTHS (July 1-Sept. 30)		TWELVE MONTHS (July 1- June 30)
	1931	1930	1931	1930	1930-31		1931	1930	1931	1930	1930-31
Coffee. (Thousand lbs)						Tea. (Thousand lbs)					
Exports.						Exports.					
<i>Exporting Countries:</i>						<i>Exporting Countries</i>					
Brazil			(4) 321	170	(4) 324	231	2,317	260			
India	150	1,640	273	2,019	23,438	Ceylon	15,111	15,481	52,250	57,100	247,397
Java and Madura .	4 098	4 253	14,822	13 155	38,105	India	54,549	50,903	123,477	135,860	347,401
						Java and Madura .			(4) 25,289	(4) 21,032	158,936
						Japan	4,154	2,851	10,205	9 685	24,315
<i>Importing Countries:</i>						<i>Importing Countries:</i>					
Germany	196	20	692	86	1,345	Belgium	2	2	9	7	31
Belgium	1,012	209	2,172	392	5,090	Irish Free State .	35	15	64	44	185
France	0	22	4	46	60	France	0	2	7	11	35
Netherlands	1,127	1,534	3,014	4 718	13,243	Gr. Brit. and N. Ir.	7,015	6 889	20,545	21,372	87,052
Portugal	79	64	192	141	553	Netherlands	11	9	35	22	115
Switzerland	26	0	126	60	399	United States . . .	40	101	84	159	486
Canada	2	4	11	13	55	Syria and Lebanon .		(4)	2 (4)	7	18
United States	1,041	3,186	4,738	6,909	24,321	Algeria				(3)	20
Ceylon	0	13	2	20	227	Union of S. Africa .		(1)	7 (1)	11	66
Syria and Lebanon .		(4)	2 (4)	4	62	Australia	64	84	194	216	851
Australia	0	2	15	13	53	New Zealand		(4)	4 (4)	20	115
Totals	—	—	—	—	2,429,261	Totals	80,981	75,837	232,472	245,555	867,013
Imports.						Imports.					
<i>Importing Countries:</i>						<i>Importing Countries</i>					
Germany	24,269	20,560	73,260	91,186	350,362	Germany	826	778	2,363	3,580	12,741
Austria	1,314	1,856	3,576	5,108	23,268	Austria	77	95	289	216	1,400
Belgium	10,239	8 975	34,937	25,089	123,457	Belgium	42	51	150	146	639
Bulgaria	62	130	273	362	1,660	Denmark	101	110	289	300	1,296
Denmark	4,956	4,863	15,518	12,884	63,224	Spain		(4)	64 (4)	40	282
Spain		(4)	7,277 (4)	8,365	53,363	Estonia	15	15	31	31	146
Estonia	22	35	53	79	309	Irish Free State . .	2,407	2,292	5,176	5,426	24,346
Irish Free State . .	22	20	88	86	525	Finland	20	26	55	62	260
Finland	3,128	3,677	8,911	10,282	40,442	France	236	292	703	688	3,536
France	42,537	32,545	120,252	96,402	405,861	Gr. Britain and N.					
Gr. Britain and N.						Ireland	47,355	54,937	140,600	151,756	541,816
Ireland	2,987	2,879	9,403	9,160	37,858	Greece	84	88	154	165	644
Greece	1,049	1,003	3,245	3,128	12,959	Hungary	64	64	161	134	650
Hungary	423	611	1,770	1,892	7,508	Italy	20	15	46	46	326
Italy	7,693	8 087	22,035	22,864	98,430	Latvia	15	13	35	44	168
Latvia	37	33	95	99	351	Lithuania	15	13	35	46	170
Lithuania	42	35	99	123	478	Norway	26	31	75	95	388
Norway	3,120	2,930	10,174	8,195	37,690	Netherlands	2,379	2,381	7,551	7,522	32,512
Netherlands	9,707	7,765	27,318	23,023	100,463	Poland	397	419	1,025	1,096	4,614
Poland	1,889	1,563	4,222	4,248	17,589	Portugal	60	40	176	141	567
Portugal	730	626	2,456	2,445	11,413	Rumania				(3)	838
Rumania				(3)	8,356	Sweden	75	84	187	192	928
Sweden	8,069	8,519	25,618	24,941	100,829	Switzerland	179	159	434	395	1,731
Switzerland	1,843	2,533	7,079	6,034	31,008	Czechoslovakia . .	273	176	494	373	1,473
Czechoslovakia . .	8,084	1,854	7,968	6,820	29,026	Yugoslavia	66	106	183	201	628
Yugoslavia	1,684	1,856	4,921	4,786	20,882	Canada	2,035	3,347	4 890	10,812	43,147
Canada	1,949	2,388	6,457	6,898	33,689	United States . . .	8,567	8,717	23,122	23,859	87,151
United States	104,768	130,772	366,771	330,373	1,728,578	Chile	399	364	1,892	1,444	5,362
Chile	908	853	2,912	2,800	10,737	Syria and Lebanon .		(4)	49 (4)	46	351
Ceylon	514	412	1,801	1,008	3,148	Turkey	163	194	470	439	2,133
Japan	417	820	1,276	983	4,478	Algeria				(3)	2,460
Syria and Lebanon .		(4)	304 (4)	399	2,732	Egypt		(4)	3,457 (4)	1,020	13,616
Turkey	1,001	913	2 610	2,859	12,853	Tunis	247	229	4,482	741	2,930
Algeria			(3)	25,576	14,548	Union of S. Africa .		(1)	1,190 (1)	911	13,298
Egypt		(4)	2,443 (4)	1,971	14,548	Australia	3,446	4,109	10,906	13,193	46,441
Tunis	410	212	811	672	3,036	New Zealand		(4)	2,169 (4)	1,997	14,405
Un. of S. Africa . .		(1)	4,824 (1)	2,377	31,890						
Australia	337	322	858	888	2,619						
New Zealand					430						
<i>Exporting Countries:</i>						<i>Exporting Countries:</i>					
India			(4)	97 (4)	88	India	992	437	2,370	1,426	6,232
India	26	218	51	1,715	4,090	Java and Madura . .		(4)	2,048 (4)	2,414	11,830
Totals	238,906	249,363	781,763	729,923	3,456,375	Totals	70,616	79,613	217,390	231,907	881,396

(1) (3) (4) See notes page 720.

COUNTRIES	SEPTEMBER		TWELVE MONTHS (Oct. 1-Sept. 30)		TWELVE MONTHS (Oct. 1- Sept. 30)	COUNTRIES	SEPTEMBER		TWO MONTHS (August 1-Sept. 30)		TWELVE MONTHS (August 1 July 31)
	1931	1930	1930-31	1929-30	1929-30		1931	1930	1931	1930	1929-1930
Cacao. (Thousand lbs.).						Total Wheat and Flour (*) (Thousand centals).					
EXPORTS.						a) NET EXPORTS					
<i>Exporting Countries:</i>						<i>Exporting Countries:</i>					
Grenada			(4)	9,784 (4)	9,035	Germany	337	(6)	(6)	(6)	(6)
Dominican Republ.	5,369	1,523		61,337	42,603	Bulgaria	992	302	1,259	725	3,527
Brazil			(4)	111,109 (4)	134,165	Spain			(4)	2 (4)	0
Ecuador			(4)	31,819 (4)	37,386	Hungary	1,235	1,254		2,017	2,663
Trinidad	1,713	1,047		61,569	54,589	Lithuania		0		7	2
Venezuela			(1)	39,458 (1)	30,543	Poland	119	320		201	342
Ceylon	317	599		8,360	8,448	Rumania					9,235
Java and Madura	329	518		3,073	2,833	U. S. S. R.					2)(8)64,560
Cameroon			(1)	29,488 (1)	21,978	Yugoslavia	1,032	465		3,642	1,596
Ivory Coast			(1)	44,525 (1)	44,494	Canada	10,042	18,600		18,539	30,814
Gold Coast	12,983	13,805		486,815	507,500	United States	6,232	9,645		12,445	23,230
Nigeria	2,333	3,115		113,325	123,523	Argentina	4,158	2,092		7,405	4,173
St. Thomas and Prince	2,039	1,695		27,011	32,560	Chile		7		134	7
Togoland			(1)	11,687 (1)	13,545	British India	93	417		93	1,440
						Japon	(6)	231		(6)	(6)
						Syria and Lebanon				(6)	(4)
						Turkey	22	57		29	77
						Algeria					(3)
						Tunis	313	317		1,074	970
						Australia	6,294	2,564		11,034	6,025
											90,379
Totals	27,507	24,507	1,651,190	1,064,689		Totals	30,816	36,422	37,354	72,430	487,942
IMPORTS.						b) NET IMPORTS.					
<i>Importing Countries:</i>						<i>Importing Countries:</i>					
Germany	10,838	10,487	180,001	165,548		Germany	(7)	2,852	710	4,590	18,689
Austria	617	758	10,693	10,170		Austria		494	631	888	866
Belgium	741	1,722	25,126	17,320		Belgium		2,385	3,666	4,065	6,387
Denmark	152	381	7,591	6,195		Denmark		1,270	534	1,803	924
Spain			(1)	22,046 (4)	17,375	Estonia		26	40	71	104
Estonia	40	33		473	366	Irish Free State		1,135	950	2,227	2,116
Irish Free State	77	40		1,786	858	Finland		251	324	489	591
Finland	15	31		220	304	France		3,109	2,829	7,734	3,801
France	7,575	7,421		61,527	78,595	Gr. Brit. and N. Ir.		19,068	13,532	32,862	23,738
Gr. Brit. and N. Ir.	20,254	10,064		141,747	123,805	Greece		1,347	1,224	2,418	2,339
Greece	240	165		2,480	2,187	Italy		335	3,046	774	6,354
Hungary	481	344		5,432	4,760	Latvia		57	117	101	278
Italy	1,329	1,365		16,619	14,952	Norway		254	472	597	952
Latvia	128	137		1,724	2,035	Netherlands		1,892	2,921	2,954	4,456
Lithuania	15	55		708	553	Portugal		128	20	434	93
Norway	578	326		4,705	4,993	Sweden		381	919	395	750
Netherlands	7,112	4,094		147,201	117,981	Switzerland		(8)1,248	(8)1,140	(8)2,282	(8)2,075
Poland	858	1,066		12,313	11,903	Czechoslovakia		1,484	1,107	2,482	2,037
Sweden	606	448		9,092	8,545	Ceylon		26	37	82	121
Switzerland	384	338		23,808	16,226	India		(7)	(7)	(7)	(7)
Czechoslovakia	1,060	844		18,237	16,691	Indochina		71	53	106	104
Yugoslavia	40	159		1,473	1,724	Japan		355	(6)	772	256
Canada	293	730		15,371	17,622	Java and Madura			(4)	123 (4)	126
United States	31,595	24,659		406,686	431,014	Syria and Lebanon			(4)	4 (7)	101
Australia	712	418		7,308	9,273	Egypt			(4)	227 (4)	388
New Zealand			(4)	1,459 (4)	1,673	Union of South Afr.					(2)
						New Zealand			(4)	51 (4)	53
Totals	85,149	66,187	1,155,828	1,062,968		Totals	35,316	36,814	65,251	63,494	389,777

(*) Flour reduced to grain on the basis of the coefficient: 1,000 centals of flour = 1,333.33 centals of grain.

a) Excess of exports over imports. — b) Excess of imports over exports.

(1) Data up to 31st July. — (2) Data up to 30th June. — (3) Data up to 30th April. — (4) Data up to 31st August. — (5) Data up to 31st March. — (6) See Net Imports. — (7) See Net Exports. — (8) Wheat only.

STOCKS

STOCKS AND AVAILABLE SALEABLE SUPPLIES OF CEREALS AND POTATOES IN FARMERS' HANDS

IN GERMANY, ON OCTOBER, 15.

PRODUCTS	% Stocks total production				% Available saleable quantities: total production			
	Oct, 15	Sept, 15	Oct, 15	Oct, 15	Oct, 15	Sept, 15	Oct, 15	Oct, 15
	1931	1931	1930	1929	1931	1931	1930	1929
Winter wheat	60.2	76.4	62.1	66.9	47.8	60.6	50.4	54.0
Spring wheat	80.9	89.5	81.0	86.1	68.2	77.8	66.8	73.5
Winter rye	60.7	77.3	71.4	72.4	27.4	37.1	40.1	42.8
Winter barley	41.5	52.8	40.4	57.1	7.0	11.2	7.2	12.9
Spring barley	79.6	91.6	67.7	77.7	53.0	64.2	42.6	53.5
Oats	86.6	94.5	89.1	87.7	20.1	23.2	24.6	31.6
Potatoes	80.0	92.0	81.7	81.1	25.3	37.4	32.2	28.6

Authority: Preisberichtstelle beim Deutschen Landwirtschaftsrat

MAIZE STOCKS REMAINING ON FARMS IN THE UNITED STATES.

YEAR	Production in the year preceding that mentioned		Quantities on farms					
			November 1st			March 1st		
	1,000 centals	1,000 bushels	1,000 centals	1,000 bushels	%	1,000 centals	1,000 bushels	%
1931	1,172,389	2,093,552	51,929	92,537	4.4	897,178	709,246	33.9
1930	1,463,914	2,614,132	40,534	72,383	2.8	552,493	686,535	37.7
1929	1,578,585	2,818,901	42,761	76,369	2.7	572,249	1,021,873	36.3
1928	1,547,332	2,763,093	30,102	53,753	1.9	598,668	1,011,908	36.6
1927	1,507,257	2,691,581	63,503	113,399	4.2	635,147	1,134,191	42.1

WHEAT AND WHEAT-FLOUR STOCKS HELD BY COMMERCIAL MILLS IN THE UNITED STATES (1)

Specification and situation	Last day of month					Last day of month				
	Sept. 1931	June 1931	March 1931	Sept. 1930	Sept. 1929	Sept. 1931	June 1931	March 1931	Sept. 1930	Sept. 1929
	1,000 centals					1,000 bushels or barrels				
Wheat held by mills and mill elevators attached to mills	57,952	13,085	33,882	61,178	65,806	96,586	21,808	56,436	101,064	100,844
Wheat in transit to merchant mills and bought to arrive	8,995	7,319	4,908	9,804	10,766	14,991	12,196	8,180	16,340	17,948
Wheat flour in mills and warehouses, and in transit, sold and unsold	6,923	5,547	7,276	7,722	8,779	3,582	2,880	3,712	3,940	4,470
TOTAL (2)	76,907	28,355	49,338	82,093	89,093	138,177	47,307	82,068	136,822	148,333

(1) Partial census, including mills accounting for over 90 % of the total capacity of all commercial mills; see article about cereal stocks on page 502 of Crop Report for August. — (2) Including flour in terms of wheat.

COMMERCIAL CEREALS IN STORE IN CANADA AND THE UNITED STATES.

SPECIFICATION	Friday or Saturday nearest to 1st of month					Friday or Saturday nearest to 1st of month				
	Novem., 1931	October, 1931	Septem., 1931	Novem., 1930	Novem., 1929	Novem., 1931	October, 1931	Septem., 1931	Novem., 1930	Novem., 1929
	1,000 centals					1,000 bushels				
WHEAT :										
Canadian in Canada	91,718	71,470	58,831	100,372	112,805	152,863	119,117	98,051	167,287	188,009
U. S. in Canada	18,976	19,507	19,418	2,854	5,439	31,627	32,511	32,564	4,756	9,065
U. S. in the United States .	146,432	154,044	156,718	126,829	121,477	244,054	256,740	261,189	211,381	202,461
Canad. in the United States .	7,558	5,470	3,977	13,267	16,990	12,596	9,116	6,628	22,112	28,316
Total	264,684	250,491	238,939	243,322	256,711	441,140	417,484	398,322	405,436	427,851
RYE :										
Canadian in Canada	7,292	6,891	3,846	7,025	4,070	13,021	12,306	12,181	12,546	7,268
U. S. in Canada	460	658	981	1,564	1,615	821	1,229	1,752	2,792	2,883
U. S. in the United States .	5,811	5,654	5,267	9,683	6,414	10,377	10,097	9,406	17,291	11,453
Canad. in the United States .	217	218	1	241	240	388	390	2	430	429
Total	13,780	13,411	10,095	18,513	12,359	24,607	24,022	23,341	33,059	22,033
BARLEY :										
Canadian in Canada	5,410	5,440	4,159	14,003	10,897	11,270	11,334	8,865	31,047	22,701
U. S. in Canada	12	12	11	213	839	24	24	24	444	1,740
U. S. in the United States .	9,534	3,461	3,404	7,209	6,106	7,873	7,211	7,092	15,018	12,721
Canad. in the United States .	2	40	1	399	960	4	84	8	832	1,999
Total	9,642	8,953	7,575	22,724	18,802	19,171	18,653	15,784	47,341	39,170
OATS : (1)										
Canadian in Canada	6,734	3,239	3,099	3,801	6,724	21,044	10,122	9,884	11,877	21,013
U. S. in Canada	78	68	122	824	1,508	244	211	380	2,576	4,712
U. S. in the United States .	5,820	5,562	4,818	10,645	10,484	18,189	17,380	15,082	33,265	37,762
Canad. in the United States .	13	13	13	9	136	41	41	41	27	420
Total	12,645	8,882	8,052	15,279	18,852	39,518	27,754	25,347	45,745	58,913
MAIZE :										
U. S. in Canada	640	289	274	420	535	1,143	516	459	750	956
of other origin in Canada .	865	295	184	316	558	1,544	527	328	564	996
U. S. in the United States .	4,111	3,135	5,076	2,548	1,887	7,341	5,598	9,064	4,550	3,369
Total	5,616	3,719	5,534	3,284	2,980	10,028	6,641	9,851	5,864	5,321

(1) All oats expressed in bushels of 32 lbs.

QUANTITIES OF CEREALS ON OCEAN PASSAGE WITH FIRST DESTINATION FOR EUROPE.

SPECIFICATION	Saturday nearest to 1st of month					Saturday nearest to 1st of month				
	Novem., 1931	October, 1931	Septem., 1931	Novem., 1930	Novem., 1929	Novem., 1931	October, 1931	Septem., 1931	Novem., 1930	Novem., 1929
	1,000 centals					1,000 bushels				
Wheat (and flour in terms of wheat)	23,093	22,700	23,147	25,339	23,410	38,488	37,848	46,912	42,282	89,016
Rye	922	518	667	1,440	403	1,646	920	1,181	2,571	720
Barley	4,088	3,720	3,544	6,412	3,816	8,517	7,750	7,383	13,358	7,950
Oats	1,178	1,183	1,274	1,882	323	3,850	3,650	3,980	5,880	1,010
Maize	26,515	21,619	23,506	16,109	10,723	47,349	38,606	41,974	28,766	10,149

Authority: Broomhall's Corn Trade News.

GRAIN AND FLOUR STOCKS AT THE PORTS OF GREAT BRITAIN AND IRELAND (1).

PRODUCTS	First of the month					First of the month				
	Novem., 1931	October, 1931	Septem., 1931	Novem., 1930	Novem., 1929	Novem., 1931	October, 1931	Septem., 1931	Novem., 1930	Novem., 1929
	1000 centals					1000 bushels				
WHEAT:										
Grain	16,416	12,480	7,392	5,064	9,168	27,360	20,800	12,320	8,440	15,280
Flour as grain . .	960	768	672	912	888	1,600	1,280	1,120	1,520	1,480
TOTAL	17,376	13,248	8,064	5,976	10,056	28,960	22,080	13,440	9,960	16,760
Barley	1,140	720	420	1,020	1,580	2,375	1,500	875	2,125	3,292
Oats	672	896	672	1,056	896	2,100	2,800	2,100	3,300	2,800
Maize	2,784	1,680	2,640	2,304	3,648	4,971	3,000	4,714	4,114	6,514

Authority: *Broomhall's Corn Trade News.*

(1) Imported cereals

STOCKS OF COTTON IN EUROPE.

COUNTRIES, PORTS, DESCRIPTIONS	Thursday or Friday nearest to 1st of month					Thursday or Friday nearest to 1st of month				
	Novem., 1931	October, 1931	Septem., 1931	Novem., 1930	Novem., 1929	Novem., 1931	October, 1931	Septem., 1931	Novem., 1930	Novem., 1929
	1000 centals					1000 bales (1 bale = 478 lbs.)				
<i>Great Britain:</i>										
American	1,159	1,395	1,691	1,443	1,257	243	292	354	302	268
Argentine, Brazil- ian, etc.	168	222	228	254	240	35	46	47	53	50
Peruvian, etc. . . .	278	232	272	442	330	58	59	57	92	79
East Indian, etc. . .	502	574	633	229	147	105	120	143	48	31
Egyptian, Sudan- ese	1,189	1,265	1,334	1,229	949	249	265	279	257	199
Other (1)	191	233	258	251	302	40	49	58	53	63
TOTAL	3,437	3,971	4,439	3,848	3,275	739	831	933	805	685
<i>Bremen:</i>										
American	809	872	1,318	1,865	1,354	169	183	276	390	288
Other	50	65	81	34	34	11	18	17	7	7
TOTAL	859	937	1,399	1,899	1,388	180	196	293	397	290
<i>La Haere:</i>										
American	815	896	1,032	883	544	170	183	217	185	114
Other	124	140	196	186	139	26	29	41	39	29
TOTAL	939	1,036	1,228	1,069	683	196	217	258	224	143
<i>Total Continent (2):</i>										
American	1,939	1,639	2,687	3,074	2,156	408	343	562	643	451
Argentine, Brazil- ian, etc.	81	97	108	108	67	17	20	23	23	14
E. Indian, Austral- ian, etc.	163	171	202	222	156	34	36	42	46	32
Egyptian	116	117	112	79	56	24	25	23	17	12
W. Indian, W. A- frican, E. Afri- can, etc.	35	40	56	119	101	7	8	12	25	21
TOTAL	2,334	2,064	3,165	3,602	2,536	488	438	662	754	539

Authority: *Liverpool Cotton Ass.*

(1) Includes: W. Indian, etc.; E. African, etc.; W. African, and Australian. — (2) Includes Bremen, Havre, and other Continental ports.

STOCKS OF COTTON ON HAND IN THE UNITED STATES.

LOCATION	Last day of the month					Last day of the month				
	October, 1931	Septem., 1931	August, 1931	October, 1930	October, 1929	October, 1931	Septem., 1931	August, 1931	October, 1930	October, 1929
	1000 centals					1000 bales (counting round as half bales)				
In consuming establishments	5,340	3,710	4,019	6,585	6,620	1,116	875	840	1,353	1,360
In public storage and at compresses . .	45,218	30,131	21,178	36,764	25,887	9,450	6,297	4,426	7,543	5,311
TOTAL . . .	50,558	33,841	25,197	43,349	32,507	10,566	7,172	5,266	8,896	6,671

STOCKS OF COTTON AT BOMBAY AND AT ALEXANDRIA.

PORTS	Thursday nearest to 1st of month					Thursday nearest to 1st of month				
	November, 1931	October, 1931	Sept., 1931	November, 1930	November, 1929	November, 1931	October, 1931	Sept., 1931	November, 1930	November, 1929
	1000 centals					1000 bales (1 bale = 478 lbs.)				
Bombay (1)	1,772	2,144	2,160	1,666	2,432	371	449	452	348	509
Alexandria	4,807	4,103	4,029	4,286	2,812	1,008	853	843	897	528

Authorities: *East Indian Cotton Ass. and Alexandria General Produce Ass.*

(1) Stocks held by exporters, dealers and mills.

IMPORT DUTIES ON CEREALS AND FLOUR

CHANGES

TO BE MADE IN THE DUTIES PUBLISHED ON PAGE 428 OF THE CROP REPORT OF JULY, 1931.

COUNTRY	PRODUCT	Date when enforced	Original data per metric quintal	Data in Amer. cents per bushel or barrel
Germany	Durum wheat for the manufacture of durum wheat groats, under customs control (1)	November 16	R. M. 11.25	73.10
France	Wheat	November 11	(2)	(2)
Spain	Maize	November 7	(3) pesetas 7.00	n. 34.31
Irish Free State	Oats	October 24	(4) 2 sh. 6 d.	14.08
Finland	Wheat	November 16	F. mks. 125.00	85.76
"	Unbolted wheat flour	"	" 150.00	336.22
"	Bolted wheat flour (5)	"	" 250.00	560.26
Latvia	Barley, oats	October 30	(6)	(6)
Poland	Wheat (7)	August 1	zl. 27 50	83.81
"	Rye (7)	"	" 18.70	53.18
"	Barley (7)	"	" 18.70	45.68
"	Oats (7)	"	" 18.70	30.30
"	Ordinary maize (7)	"	" 5.60	18.77
"	Maize, horse-tooth type	"	(8) 0.30	(8) 0.83
"	Wheat flour (7)	"	" 40.70	405.18
"	Rye flour (7)	"	" 27.50	273.78
Czechoslovakia	Rye	November 5	cz. crs. 56.00	42.67
"	Oats	"	" 65.00	28.30
"	Wheat and rye flour	"	" 125.00	383.39

(1) Duty valid until 31 July 1932, only for mills which produced durum wheat groats during 1931 before October 1st. — (2) Import duty unchanged, for all imports of foreign wheat a nominal import licence, which is not transferable, must be presented to the customs authorities, this permit must specify the quantity for which it is valid — (3) 25 % of the duties are expressed in gold pesetas and 75 % in paper pesetas with a supplement fixed every ten days — (4) Duty per cwt. — (5) Bolted wheat flour imported for the manufacture of macaroni, subject to prescribed conditions: Finnish marks 150.00 (336.22 \$c per barrel). — (6) Import duties unchanged, but imports during the year 1932 are to be limited to 5,000 metric quintals (22,965 Amer. bushels of barley and 34,447 Amer. bushels of oats); proportional quota of these quantities are to be allocated for the period October 30 to December 31, 1931, as well as for the four quarters of 1932. — (7) The duty includes a manipulation tax to the amount of 10 % of the original import duty. — (8) Manipulation tax.

MONTHLY REVIEW OF PRICES (I)

PRODUCTS, MARKETS AND DESCRIPTIONS	Average (2)									
	Nov 13, 1931	Nov. 6, 1931	Oct. 30, 1931	Oct. 23, 1931				Commercial Season		
					Oct. 1931	Nov 1930	Nov. 1929	1930-31	1929-30	
WHEAT.										
Budapest (b): Tisza region (73-80 kg. p. hl.; pengo p. 100 kg.)	11.13	12.10	10.60	10.55	9.80 n	14.43	23.11	15.34	22.04	
Braila: Home grown (79-80 kg. p. hl.; lei p. 100 kg.)	n. 305	302	n. 280	295	(3) 277	337	674	351	612	
Winnipeg: No. 1 Manitoba (cents p. 60 lbs.)	65 1/8	73 1/4	69	62 7/8	60 1/8	64 1/8	134 1/4	64 1/4	124 3/4	
Chicago: No. 2 Hard Winter (4) (cents p. 60 lbs.)	63 1/2	68	n. 60	58 3/4	52 3/4	74 3/4	123 3/4	78	114 1/4	
Minneapolis: No. 1 Northern (cents p. 60 lbs.)	73 3/8	83 3/4	76 3/4	69 3/4	65 3/8	75 3/8	126 3/4	77 3/8	117 1/2	
New York: No. 2 Hard Winter (4) (cents p. 60 lbs.)	72 1/2	80 1/4	72 1/4	68 3/8	65 3/8	87	130 1/2 n.	91 1/8	121 1/4	
Buenos Aires (a); Barletta (80 kg. p. hectol. - pesos paper per quintal)	7.30	8.05	7.90	7.20	7.01	7.02	10.63	6.83	10.65	
Karachi: Karachi white, 2 1/2 % barley, 1 1/4 % durt (rupees per 656 lbs.)	22-6-0	22-4-0	20-5-0	18-10-0	18-3-10	19-14-3	40-1-7	19-15-2	36-6-0	
Berlin: Home grown (Reichsmarks p. quintal)	22.35	22.95	22.05	21.55	21.57	24.97	23.21	26.00	25.33	
Hamburg, c. i. f. (Reichsmarks p. quintal):										
No. 3 Manitoba	(5) 11.47	(5) 12.32	(5) 11.20	(5) 10.51	(5) 10.10	(5) 12.77	22.53	—	21.30	
No. 2 Hardwinter	11.43 n	11.84	10.34	9.15	9.01	n. q.	20.24 n.	13.00	19.49	
Barusso (79 kg. p. hectol.)	10.11	10.58	9.32	8.76	8.49	6 11.56	19.37	11.22	18.72	
Antwerp (Belgian francs p. quintal):										
Home grown	n. q.	n. q.	n. q.	n. q.	n. q.	82	159	95 1/2	154 3/4	
No. 2 Hard Winter, Gulf	(7) 101	(7) 88	(7) 82	(7) 76 1/2	(7) 876	106	173	112 1/2	171	
Paris: Home grown, 75-77 kg. (francs p. quintal)	162.25	164.25	161.75	162.50	162.45	164.75	142.65	175.00	139.40	
London: Home grown (shillings per 504 lbs.)	30/6	30/6	26/-	26/-	25/7	29/7	42/2	27/1	40/10	
London and Liverpool c. i. f., shipping current month (shillings p. 480 lbs.):										
South Russian (on sample)	(9) 27/8	(9) 29/6	(9) 25/9	23/6	22/8	22/11	n. q.	23/7	n. q.	
No. 3 Manitoba	29/-	31/-	27/6	23/8	24/8	25.10	47.10	25/4	45/2	
No. 2 Hard Winter (4)	(10) 23/3	(10) 30/-	(10) 26/3	23/3	23/-	n. q.	43.4	26/4	41/5	
White Pacific	36/-	n. q.	n. 29 6	n. q.	n. 27/9	27.5	44.8	26/7	42/3	
Rosafé (63 1/2 lbs.), afloat	(11) 27/3	(11) 28/9	(11) 25/6	(11) 22/-	(11) 23/5	(11) 24/4	40/8	23/5	40/3	
Choice White Karachi	n. q.	32/-	n. q.	26/-	n. 25 6	27/2	n. q.	27/-	42/2	
Australian	(13) 30/-	(13) 31/-	(14) 25/6	(14) 26/6	25/3	27/8	45/6	25/7	43/6	
Milan (b): Home grown, soft (liras p. quintal)	100.00	101.00	98.00	96.00	94.80	109.60	129.65	109.10	131.30	
Genoa c. i. f. (shillings p. metric ton): La Plata	n. q.	n. q.	n. q.	n. q.	n. q.	n. 124/-	192/4	110/-	184/6	
RYE.										
Budapest (b): Home grown (pengo p. 100 kg.)	12.20	11.85	10.95	10.45	9.71 n.	8.10	14.82	10.79	13.44	
Berlin: Home grown (Reichsmarks per quinta)	19.40	20.00	19.40	18.60	18.82	15.20	17.02	17.23	17.04	
Hamburg c. i. f.: La Plata, 74-75 kg. (R. M. p. 100 kg.)	9.69	n. q.	n. q.	n. q.	n. q.	n. 7.45	16.15 n.	7.66	14.57	
Minneapolis: No. 2 (cents per 56 lbs.)	52	53 1/2	45 1/2	41	41 1/2	42 1/2	94	42 1/2	80 1/2	
Groningen (c): Home grown (florins per quintal)	5.35	5.35	4.55	4.30	4.40	4.30	7.25	4.45	6.23	
BARLEY.										
Braila: Home grown (62-63 kg. p. hl.; lei p. 100 kg.)	280	n. 295	260	246	(15) 219	177	390	232	304	
Winnipeg: No. 4 Western (cents p. 48 lbs.)	40 1/2	41	37 1/4	33 3/8	31 3/8	22 3/4	60 1/2	28 1/2	51 1/4	
Chicago: Feeding (cents per 48 lbs.)	44	46	44	43	47 1/4	46 3/4	61 1/4	43 3/4	57 3/4	
Berlin: Home grown fodder (Reichsmarks per quintal)	16.65	17.50	16.55	15.80	15.70	17.55	17.36	19.52	17.40	
Antwerp: Danube (francs per quintal)	84	73	70 1/2	64	(16) 63 1/2	62 1/2	123 1/2	73 1/4	107 1/2	
London: English malting (shillings p. 448 pounds)	42/-	42/-	41/-	41/-	41/-	39/4	47/-	35/8	39/-	
London and Liverpool, c. i. f., parcels (shillings per 400 lbs.):										
Danubian 3 %	22/6	n. q.	n. q.	n. q.	n. q.	13/6	26/3	15/2	22/8	
Russian (Aroff-Black sea)	22/-	23/6	20/-	18/8	17/3	n. 12/-	n. q.	14/3	18/11	
Canadian Western, No. 3 1/2	23/6	24/-	20/9	18 10 1/2	18/8	15/3	29/-	15/11	27/-	
Californian malting (shillings p. 448 lbs.)	39/-	39/-	36/6	35/6	35/2	26/1	34/10	27/8	32/6	
Groningen (c): Home grown winter (fl. p. quintal)	6.10	6.35	5.60	5.60	5.25	4.40	8.80	4.97	7.55	

(a) Thursday prices. — (b) Saturday prices. — (c) Prices of preceding Tuesday.

(1) All quotations are, unless otherwise stated, for spots. — (2) The monthly averages are based on Friday quotations, the annual averages on the monthly. — (3) October 16: 270. — (4) Quoted formerly as No. 2 Winter. — (5) No. 2 Manitoba. — (6) 78 kg. per hl. — (7) No. 2 Hard Winter. — (8) October 16: 73 1/2. — (9) Russian Winter, on sample. — (10) Hard Winter on sample. — (11) 63 lbs. per bushel. — (12) 62 1/2 lbs. per bushel. — (13) West Australian, shipping December-January. — (14) South Australian. — (15) October 16: 210. — (16) October 16: 60. — (17) Instead of No. 4 Western

PRODUCTS, MARKETS AND DESCRIPTION	Nov 13, 1931	Nov 6, 1931	Oct. 30, 1931	Oct 23, 1931	Average (1)					
	1931	1931	1931	1931	Oct. 1931	Nov. 1930	Nov 1929	Commercial Season	1930-31	1929-30
OATS.										
Braila: Home grown (43-44 kg. p. hl.; lei p. 100 kg.)	325	325	310	282	(2)258	167	288	247	256	
Winnipeg: No. 2 White (cents per 34 lbs.)	33 1/2	35 3/8	35 1/2	33 1/4	31 1/2	27 5/8	46 1/4	30	58 1/8	
Chicago: No. 2 White (cents per 32 lbs.)	27 1/2	27 3/4	26 3/4	24	24 3/8	33 3/4	46 3/4	32 7/8	44 1/8	
Buenos Aires (a): Current quality (pesos paper per quintal)	6.40	7.10	7.90	7.00	6.57	3.22	6.16	3.58	5.30	
Berlin: Home grown (Reichsmarks per quintal)	14.70	15.45	14.80	14.25	14.33	14.40	16.04	16.17	15.62	
Paris: Home grown, black and other (francs per quintal)	92.00	21.00	92.50	90.50	89.20	70.20	93.80	81.00	81.15	
London: Home grown white (shillings per 336 lbs.)	21/8	21/6	20/-	20/-	20/-	18/-	23/-	18/4	21/-	
London and Liverpool c. i. f., parcels (shillings p. 320 lbs.):										
Danubian (39-40 lbs.)	n. q.	n. q.	n. q.	n. q.	n. q.	n. 11/1	n. q.	n. 12/1	(3)n. 16/4	
Plate (f. a. q.)	17/6	18/9	16/6	15/9	15/4	10/4	19/-	10/9	16/1	
Chilian Tawny	n. q.	n. q.	18/-	n. q.	n. q.	11/5	20/5	12/-	17/8	
Milan (b): spot (liras per quintal):										
Home grown	73.50	73.50	72.00	72.00	71.40	76.35	86.20	73.95	80.75	
Foreign imported	69.00	69.00	67.50	67.00	64.90	55.75	83.20	60.40	74.30	
MAIZE.										
Braila, Danube (lei per quintal)	160	175	157	150	(4)144	192	395	210	309	
Chicago: No. 2 Mixed American (cents per 56 lbs.)	42	46	42 3/4	38 3/4	39 1/4	74 3/4	91 1/8	58 1/4	85 1/8	
Buenos Aires (a): Yellow Plate (pesos paper per quintal)	4.47	5.35	5.30	4.55	4.25	3.89	7.23	3.82	6.17	
Antwerp, spot (Belgian francs per quintal):										
Bessarabian	n. q.	68	63	61	(5)60 1/2	68	n. q.	71 1/4	n. 97 1/4	
Cinquantino	71	68	57 1/2	54	(6)52 1/2	90 1/2	143 1/2	81	131 1/4	
Yellow Plate	68	68	54	52 1/2	(7)50	68	126 1/2	85	109 1/4	
London and Liverpool, parcels, c. i. f. (shillings per 480 lbs.):										
Danube	(8)19/-	(8)21/3	(8)18/9	(8)16/6	(8)17/4	16/10	32/2	n. 17/4	24/11	
Yellow Plate	17/3	19/6	18/-	15/6	15/5	16/7	30/8	15/6	25/3	
No. 2 White African	21/6	22/6	21/-	20/6	19/11	n. q.	33/10	n. 18/11	26/-	
Milan (b): Home grown (liras per quintal)	61.50	61.50	59.50	57.50	56.30	52.10	82.00	51.90	71.35	
RICE (CLEANED).										
								1930	1929	
Milan (b): Maratelli (lire per quintal)	140.00	140.00	140.00	140.00	129.40	122.25	185.00	152.15	195.70	
Rangoon: No. 2 Burma (rupees per 7500 lbs.)	275	275	270	275	276	317 1/2	467	393 3/4	462 3/4	
Saigon (Indochinese piastres p. quintal):										
No. 1 Round white (25 % broken)	7.13	6.51	6.51	6.42	6.44	8.73	13.15	11.30	11.58	
No. 2 Japan (40 % broken)	6.64	6.10	6.09	6.01	6.01	8.12	12.63	10.89	11.08	
London (a): c. i. f. (shillings per 112 lbs.):										
Spanish Belloch, No. 3 oiled	12/9	13/-	12/9	12/9	12/11	12/11	17/4	14/1	17/11	
Italian good, No. 6 oiled	n. q.	n. q.	n. q.	n. q.	n. q.	12/7	17/5	14/11	18/9	
American Blue Rose	20/3	19/9	18/-	17/6	18/6	18/7	21/3	21/9	21/10	
Burma, No. 2	8/7 1/2	8/6	8/4 1/2	8/6	8/6	9/-	12/10	10/11	15/2	
Saigon, No. 1	10/1 1/2	9/3	8/9	8/7 1/2	8/9	n. q.	12/6	11/6	13/8	
Siam, Garden, No. 1	11/3	11/3	11/3	11/7 1/2	11/5	10/10	15/1	14/-	15/1	
Tokio: Various qualities (yens per koku)	17.50	17.30	16.00	17.30	17.28	18.07	29.20	25.57	29.06	
LINSEED.										
Buenos Aires (a): Current quality (pesos paper per quintal)	11.00	11.60	12.45	11.80	11.43	14.42	21.43	17.19	18.20	
Antwerp: Plate (Belgian francs p. quintal)	133	131	123	116	(9)120	205 1/2	374	284 3/4	318 3/4	
Hull, c. i. f.: Plate (p. sterling p. l. ton)	9-18-9	9-16-3	9-12-6	9-0-0	8-17-6	10-6-10	20-18-3	15-0-5	18-5-0	
London, c. i. f.: Bombay bold (p. st. per long ton)	12-2-6	12-7-6	12-5-0	11-12-6	11-8-0	13-13-9	23-6-9	17-14-4	20-16-1	
Duluth: No. 1, Northern (cents p. 56 lbs.)	144 1/2	143 3/4	137	131	129 7/8	164	321 1/8	236	273 1/8	

(a) Thursday prices. — (b) Saturday prices.

(1) The monthly averages are based on Friday quotations, the annual averages on the monthly. — (2) October 16: 230. — (3) Weight not indicated. — (4) October 16: 140, new harvest. — (5) October 16: 59. — (6) October 16: 51. — (7) October 16: 49. — (8) Dan., Galatz-Foxonian. — (9) October 16: 119.

PRODUCTS, MARKETS AND DESCRIPTION	Nov. 13, 1931	Nov. 6, 1931	Oct. 30, 1931	Oct. 23, 1931	Average (1)					
					Oct. 1931	Nov. 1930	Nov. 1929	Commercial Season		
									1930-31	1929-30
COTTONSEED										
Alexandria : Sakellandis (piastres per ardeb)	66 0	65.7	(2) 62 2	(2) 58 3	(2) 57 6	54 3	87 3	52.2	67 9	
Hull : Sakellandis (p. sterl. per long ton)	6-15-0	6-17-6	6-12-6	6-7-6	6-4-9	5-16-7	8-12-9	5-12-6	6-18-2	
COTTON.										
New Orleans Middling (cents per lb.)	6.43	6 68	6.47	6 79	6.05	10 55	17 29	10.07	16.17	
New York : Middling (cents per lb.)	6 55	6 75	6.70	6 95	6.28	10 57	17 63	10.38	16.60	
Bombay : M. g. Broach f. g. (rupees per 784 lbs.)	191	189	184	176	170 ½	199 ¾	322 ½	191 ¾	283 ½	
Alexandria (a) (talars per kantar) :										
Sakellandis f. g. f.	13 12	13 37	13 22	13 42	12 85	17 ½	27 ¾	17.12	28 ¾	
Ashmouni (Upper Egypt) f. g. f.	9.80	10 00	9 45	9 45	9 03	11 ¾	19 ½	12.00	19 ¾	
Bremen : Middling (U. S. cents per lb.)	7 78	7 67	7 75	7 64	7 24	12 00	19 27	11.59	18.27	
M. g. Broach fully good (pence per lb.)	n. 4 40 n.	4 40 n.	4 00 n.	4 00 n.	3 85 n.	4 60 n.	7 73 n.	4 63 n.	6.83	
Le Havre : Middling, Gulf (francs per 50 kilogr.)	220	217	220	222	201	300	575	349	545	
Liverpool (pence per lb.) :										
Middling fair	n. 6.23 n.	6 20 n.	6 19 n.	6 07 n.	5 84 n.	7 12 n.	10.92 n.	6.93 n.	10.39	
Middling	5 08	5 03	4 99	4 97	4 72	5 97	9 67	5.72	9 09	
São Paulo, good fair	5 23	5 20	5 19	5 07	4 84	6 20	9 57	5.91	9 02	
M. g. Broach, fully good	n. 4 76 n.	4 64 n.	4 49 n.	4 27 n.	4 12 n.	4 41 n.	7 56 n.	4 25 n.	6.80	
Sakellandis, fully good fair	7 00	7 55	7 35	7 40	7 16	9 62	14 93	9 08	14.52	
BUTTER.										
								1930	1929	
Copenhagen (a) (Kr p. 100 kg.)	210	207	212	225	213	224	320	245	308	
Maastricht, auction (b) : Dutch (florins p. kg.)	1.15	1.24	1 35	1 21	1 24	1 63	2 24	1.70	2 09	
Hamburg, auction (b) : Schleswig-Holstein butter, with quality mark (R. M. per 50 kg.)	121 02	120 80	129 13	128 29	130 77	142 53	190 76	146 67	178 03	
Kempten (b) : Allgäu butter (Pfennige p. half kg.)	102	102	105	103	101	120	166	128	159	
London (c) (shillings p. cwt.) :										
British blended	140/-	140/-	140/-	140/-	141/9	147/4	196/-	158/8	196/-	
Danish	136/-	138/-	140/-	135/-	138/-	147/6	196/5	153/6	186/6	
Irish creamery, salted	124/-	124/-	126/-	123/-	126/10	124/4	184/-	134/0	179/4	
Dutch	138/-	138/-	140/-	135/-	137/9	148/-	197/5	151/11	182/4	
Argentine	117/-	119/-	121/-	120/-	120/10	119/3	178/5	135/0	174/1	
Siberian	3) 95/-	3) 98/-	3) 99/-	3) 99/-	4) 101/5	111/-	172/10 n.	123/0	167/2	
Australian, salted	118/-	120/-	120/-	120/-	120/7	116/-	180/-	135/9	176/-	
New Zealand, salted	124/-	126/-	128/-	126/-	127/7	118/3	182/10	187/8	178/9	
CHEESE.										
Milan (lire per quintal) :										
Parmigiano-Reggiano, 1st quality of last year's production	975	975	975	975	975	1,100	1,187	1,160	1,074	
Green Gorgonzola, mature, choice	600	600	615	615	617	699	885	671	829	
Rome : Roman pecorino, choice (lire p. quintal)	1,175	1,175	1,175	1,175	1,151	1,128	1,370	1,207	1,546	
Alkmaar : Edam 40 + 40% butterfat, with the country's cheesemark, factory cheese, small; florins, p. 50 kg.)	28.50	29.00	29.00	27.00	29.50	39.75	52.60	40.83	47.10	
Gouda (5) : Gouda 45 + (whole milk cheese, with the country's cheesemark, home made; florins, p. 50 kg.)	36.50	36.00	36 00	36.50	37.30	45.75	58.70	45.56	52.45	
Kempten (b) : (Pfennige per half kg.) :										
Softcheese, green (20 % butterfat)	25	25	25	25	25	31	38	27	35	
Emmenthal from the Allgäu (whole milk cheese) 1st quality	93 ½	96 ½	96 ½	96 ½	98	(6) 91	(6) 102	(6) 97	(6) 107	
London (a) (shillings per cwt.) :										
English Cheddar	92/-	92/-	89/-	92/-	7) 91/10	97/6	108/-	103/4	121/3	
Canadian	73/-	73/-	71/6	72/-	71/11	81/6	102/5	93/11	107/8	
New Zealand	71/6	71/6	72/-	71/6	72/-	78/1	96/11	82/2	96/5	
Liverpool (e) : Engl. Cheshire, ungraded (sh. p. cwt.)	114/4	109/8	95/8	95/8	91/11	95/8	134/6	96/5	111/9	

(a) Thursday prices. — (b) Wednesday prices. — (c) Average prices for weeks ending on preceding Wednesday.

(1) The monthly averages are based on Friday quotations, the annual averages on the monthly. — (2) November delivery. — (3) Price for the indicated Friday and preceding Thursday. — (4) Averages, calculated from the prices for the Fridays and the Thursdays which precede: July: 95/8; August: 93/-; September (3 weeks): 90/8. — (5) Indicated formerly as Bodegraven. — (6) Average price for all qualities. — (7) New.

THE PRICES OF AGRICULTURAL PRODUCTS IN OCTOBER 1931

In the following pages the index-numbers of prices of agricultural products and other price indices of interest to the farmer are given as published in the different countries. The indices collected together have been obtained according to different methods and criteria in the various countries. A detailed account of the items included in each series and the system of construction of the index-numbers may be found in the volume published especially for this purpose by the Institute, entitled « Index-numbers of prices of agricultural products and other price indices of interest to the farmer ». We refer the reader to this volume for an exact interpretation of the significance of the different series of data.

Owing to the substantial divergence which often exists in the value and significance of the indices available, much care is advisable in their utilization from an international point of view. For this reason it has been considered opportune to reproduce all the data in their original form only, without attempting to formally unite them. The latter process, by a comparison of often heterogeneous data, might easily lead to the drawing of erroneous relations and conclusions.

But in addition to the original data, and subject to the above comments, a summary tables is given below

COUNTRIES	Percentage variations in the index-numbers for October, 1931			
	compared with those for September, 1931		compared with those for October, 1930	
	Index-numbers of prices of agricultural products	General index-numbers of prices	Index-numbers of prices of agricultural products	General index-numbers of prices
Germany	— 2.6	— 1.4	— 9.9	— 10.9
England and Wales	— 5.8	+ 2.0	— 12.4	— 9.0
Argentina	+ 10.5	—	— 12.7	—
Canada	+ 3.2	— 0.6	— 22.6	— 13.1
Estonia	— 4.3	—	— 12.0	—
United States a)	— 5.6	—	— 35.8	—
Finland b)	— 2.8	— 1.0	— 28.8	— 17.2
Hungary	— 1.5	— 3.8	— 10.7	— 4.7
Italy	— 0	+ 1.0	+ 6.0	+ 3.2
New Zealand	+ 0.9	— 0.1	— 13.8	— 14.7
Netherlands	—	—	—	—
Poland	— 6.5	— 2.3	— 24.7	— 19.8
Yugoslavia c)	— 1.1	— 0.4	— 13.6	— 15.0
	+ 1.0	— 2.9	c) — 8.4	— 7.9
	d) — 6.4		d) — 12.3	

a) "Bureau of Agricultural Economics". — b) "Bureau of Labor". — c) Products of the soil. — d) Animal products.

INDEX-NUMBERS OF PRICES OF AGRICULTURAL PRODUCTS AND OF COMMODITIES BOUGHT BY THE FARMER *

COUNTRIES AND CLASSIFICATION	October	Sept.	August	July	June	May	October	October	Year	
	1931	1931	1931	1931	1931	1931	1930	1929	1930 (1)	1929
GERMANY										
(Statistisches Reichsamt)										
1913 = 100.										
Foodstuffs of vegetable origin	112.5	111.7	114.6	126.1	129.8	131.8	108.5	121.5	115.3	126.3
Livestock	76.9	84.7	89.0	81.7	81.5	83.9	104.7	133.8	112.4	126.6
Livestock products	106.7	108.4	107.9	105.6	103.3	102.5	127.5	153.1	121.7	142.1
Feeding stuffs	95.5	96.8	98.3	104.7	114.5	120.0	57.2	113.1	93.2	125.9
Total agricultural products	98.5	101.1	103.4	105.4	107.3	109.2	103.3	131.7	113.1	136.2
Fertilizers	74.0	73.6	72.8	71.3	77.9	77.2	80.4	82.3	82.4	84.5
Agricultural dead stock	120.5	129.7	120.9	129.9	130.0	130.6	138.6	141.2	139.4	141.3
General index-number	107.1	108.6	110.2	111.7	112.3	113.3	120.2	137.2	124.6	137.2
ENGLAND AND WALES										
(Ministry of Agriculture)										
Average of corresponding months										
1911-13 = 100										
Agricultural products	113	120	121	121	123	122	120	142	134	144
Feeding stuffs	83	76	77	81	82	87	82	130	96	139
Fertilizers	80	83	95	100	100	100	99	99	101	100
General index-number (2).	96.8	94.9	93.1	94.4	97.2	96.7	106.4	130.7	114.1	135.3
ARGENTINA										
(Banco de la Nación argentina)										
1926 = 100										
Cereals and linseed	63.3	52.7	53.7	55.1	54.5	54.3	70.7	108.1	82.3	100.4
Meat	38.3	97.1	96.4	92.5	93.8	99.8	109.6	125.3	110.9	113.6
Hides and skins	61.5	53.4	59.3	63.1	64.1	63.1	72.3	83.8	71.6	95.0
Wool	80.3	54.3	55.8	53.4	54.8	57.6	62.2	88.6	67.4	103.5
Dairy products	74.2	75.8	84.8	84.0	74.6	73.4	78.5	109.1	82.4	105.9
Forest products	33.5	39.5	91.6	107.1	108.7	108.7	108.7	111.8	107.9	111.5
Total agricultural products	67.3	60.9	62.2	62.9	62.8	62.6	77.1	107.6	85.5	102.6
CANADA										
(Internal Trade Branch										
of the Dominion Bureau of Statistics)										
1926 = 100										
Field products (grain, etc.)	44.0	41.1	43.0	44.8	47.3	48.2	53.8	99.5	70.0	93.8
Animals and animal products	72.1	72.5	74.3	73.2	73.1	76.9	98.3	116.6	102.9	112.5
Total Canadian farm products	54.5	52.8	54.7	55.4	56.9	58.9	70.4	105.0	82.3	100.8
Fertilizers	75.5	74.8	36.8	86.9	86.9	86.9	80.2	80.5	88.2	92.6
General index-number	70.4	70.0	70.9	71.7	72.2	73.0	81.0	96.8	86.6	95.6
ESTONIA										
(Central Bureau of Statistics)										
1922 = 100.										
Commodities imported	86	87	...	92	93	91	90	88	79	95
Commodities exported	57	60	...	62	64	62	72	111	83	113
Agricultural products imported and exported	66	66	...	71	73	71	75	103	79	106

* For an explanation of the method of calculation of the index-numbers, reference should be made to the Institute's publication "Index-numbers of Prices of Agricultural Products and other Price-indices of interest to the Farmer" (Rome, 1930).
(1) Some data are provisional. — (2) Calculated by the "Statist", reduced to base-year 1913 = 100.

COUNTRIES AND CLASSIFICATION	October	Sept.	August	July	June	May	October	October	Year	
	1931	1931	1931	1931	1931	1931	1930	1929	1930	1929
UNITED STATES (Bureau of Agricultural Economics) Average 1909-10 to 1913-14 = 100										
Cereals	46	50	54	57	67	74	92	128	100	121
Fruits and vegetables	70	83	97	110	114	119	127	168	158	136
Meat animals	79	86	92	92	91	99	123	131	134	156
Dairy products	95	92	87	85	86	91	125	141	123	140
Poultry and poultry products	110	99	93	83	81	77	129	181	126	159
Cotton and cottonseed	42	47	53	71	65	74	76	141	102	145
Total agricultural products	68	72	75	79	80	86	106	140	117	138
Commodities purchased by farmers (1)	120	127	127	129	130	131	144	154	146	155
Agricultural wages (1)	—	113	—	—	123	—	(2) 150	174	152	170
UNITED STATES (Bureau of Labor) 1926 = 100.										
Grains	44.3	44.2	44.8	49.0	56.0	50.6	72.1	90.1	58.3	97.4
Livestock and poultry	57.6	61.0	67.0	63.0	61.9	64.1	82.4	98.8	89.2	106.1
Other farm products	64.2	65.4	67.3	71.3	70.8	71.5	86.3	108.9	91.1	106.6
Total farm products	53.8	60.5	63.5	64.9	65.4	67.1	82.6	103.9	88.3	104.9
Agricultural implements	92.3	94.5	94.5	94.5	94.6	94.7	91.9	96.1	95.1	97.9
Fertilizer materials	70.2	74.2	74.4	78.7	79.8	80.5	83.6	90.1	85.6	92.1
Mixed fertilizers	77.2	77.6	78.7	80.2	82.4	82.8	92.9	97.4	93.0	97.2
Cattle feed	49.4	44.4	50.8	55.8	61.1	67.9	80.6	130.4	99.7	121.6
Non-agricultural commodities	71.2	71.7	72.1	71.5	71.4	72.6	82.8	94.3	85.9	94.4
General index-number	68.4	69.1	70.2	70.0	70.0	71.3	82.6	96.3	86.3	96.5
FINLAND (Central Bureau of Statistics) 1926 = 100.										
Cereals	73	70	70	79	78	79	68	85	70	98
Potatoes	49	50	84	101	73	88	51	64	76	148
Fodder	53	52	60	65	65	67	37	67	62	89
Meat	54	59	64	65	66	67	77	95	83	103
Dairy products	77	72	70	70	70	71	83	110	84	103
Total agricultural products	67	66	70	71	70	71	75	95	82	100
General index-number	82	79	81	82	83	84	86	96	90	98
HUNGARY (Central Bureau of Statistics) 1913 = 100.										
Agricultural and livestock products	88	88	83	87	82	85	83	103	—	—
General index-number	97	96	92	95	91	93	94	111	—	—
ITALY (Consiglio Provinciale dell'Economia Corporativa di Milano) 1913 = 100.										
National agricultural products	337.20	334.28	330.21	337.05	348.32	357.20	390.97	481.80	413.39	508.76
General index-number	329.85	330.33	331.42	337.43	339.33	347.16	386.60	470.19	411.04	480.69
NEW ZEALAND (Census and Statistics Office) Average 1909-13 = 100.										
Dairy produce	102.9	103.7	96.7	88.3	93.6	110.2	148.5	120.7	145.7	
Meat	120.7	127.9	126.0	125.7	128.5	143.7	166.5	164.7	173.9	
Wool	63.0	63.9	73.2	74.2	76.7	86.2	141.3	100.7	170.9	
Hides, skins, and tallow	79.8	82.1	83.4	89.2	95.1	112.1	172.9	145.4	188.6	
Miscellaneous	109.8	93.9	122.1	129.2	130.7	114.7	149.0	134.0	146.7	
Total agricultural products	99.7	100.5	100.1	99.3	96.2	114.3	153.5	126.7	161.3	

(1) 1910-14 = 100. — (2) September.

COUNTRIES AND CLASSIFICATION	October	Sept	August	July	June	May	October	October	Year	
	1931	1931	1931	1931	1931	1931	1930	1929	1930 (1)	1929
NORWAY (Kgl. Selskap for Norges Vel) Average 1909-14 = 100										
Cereals	106	111	112	111	108	107	109	150	(2) 114	(2) 155
Potatoes	100	97	170	257	165	137	172	106	(2) 152	(2) 120
Pork	62	86	91	85	70	73	98	140	(2) 98	(2) 141
Other meat	127	137	158	160	153	166	143	184	(2) 103	(2) 199
Eggs	126	117	87	81	77	83	151	168	(2) 121	(2) 135
Dairy products	131	127	126	125	126	124	158	175	(2) 150	(2) 161
Concentrated feeding stuffs	97	97	102	103	105	108	118	153	(2) 117	(2) 148
Maize	73	71	79	81	87	85	107	152	(2) 103	(2) 148
Fertilizers	81	81	85	96	96	96	106	100	(2) 101	(2) 103
NETHERLANDS (Directie van den Landbouw) Average 1924-25 to 1928-29 = 100.										
Products of the soil	58	57	61	67	71	83	68	73	(3) 67	(3) 68
Animal products	58	64	68	70	71	72	80	99	(3) 77	(3) 95
Total agricultural products	58	62	67	69	71	74	77	93	(3) 75	(3) 88
Agricultural wages	95	95	95	95	95	95	100	100	(3) 90	(3) 100
General index-number (4)	60.2	61.6	63.7	65.6	67.7	69.0	75.1	94.7	79.2	96.1
POLAND (Central Bureau of Statistics) 1927 = 100.										
Products of the soil		46.6	47.7	48.2	62.8	65.3	45.8	60.9	52.1	73.1
Products of agricultural industry		60.1	62.1	61.1	72.9	77.2	63.1	72.6	69.9	80.9
Total products of plant origin	56.6	53.3	54.8	58.0	68.1	73.1	54.0	66.5	60.5	76.9
Animals		59.3	66.2	67.0	60.5	56.2	77.8	103.7	82.4	93.4
Dairy products		63.3	61.2	59.2	57.5	65.1	82.2	107.1	81.6	102.9
Total products of animal origin	55.3	61.3	64.2	63.6	59.3	60.1	82.4	105.3	81.0	100.2
Total agricultural products	55.6	56.2	58.3	58.8	63.8	66.8	64.3	80.6	68.5	85.7
Fertilizers		118.5	118.5	118.5	118.5	124.7	126.2	130.6	127.8	126.5
Industrial products	76.0	76.0	77.8	80.1	80.8	81.3	90.5	102.7	94.0	103.3
General index-number	66.6	66.9	68.9	70.3	73.2	74.8	78.4	93.1	82.3	95.7
YUGOSLAVIA (National Bank of the Kingdom of Yugoslavia) 1926 = 100.										
Products of the soil	71.1	70.4	75.7	78.9	77.8	80.5	77.6	106.6	89.3	118.6
Animal products	64.1	70.6	75.6	74.7	71.7	73.2	75.4	106.6	96.3	107.2
Industrial products	69.3	72.2	70.8	71.3	71.7	73.0	73.9	89.9	81.8	92.6
General index-number	69.5	71.6	73.6	74.4	73.8	75.4	75.5	96.8	86.6	100.6

(1) Some data are provisional — (2) Agricultural year April 1-March 31 — (3) Agricultural year July 1-June 30 — (4) Calculated by the Central Statistical Bureau of the Netherlands, reduced to the base 1925-1929 = 100.

RATES OF FREIGHT

(Rates for full cargoes).

VOYAGES	Average							
	Nov	Nov	Oct	Oct.				Commercial Season
	13,	6,	30,	23,	Oct	Nov	Nov	
	1931	1931	1931	1931	1931	1930	1929	
								1930-31 1929-3
SHIPMENTS OF WHEAT AND MAIZE.								
Danube to Antwerp/Hamburg (shill er	15 3	15 3	15 1	15 1	14/8	13/7	n q	13/11 15/8
Black Sea to Antwerp/Hamburg 2240 lbs	11/9	12 -	11/9	11/3	11/5	n. 11/-	n. q.	10/10 n. q.
St. John to Liverpool (1)	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	1/6 1/5
Montreal to United Kingdom (shill per	2/6	2/6	2/6	2/6	2/4	1/8	1/9	1/10 1/10
Gulf to United Kingdom 480 lbs	(1) 2/9	(1) 3/-	(1) 3/-	n. q.	2/8	(1) 2/7	2/6	2/3 2/6
New York to Liverpool (1)	2/3	2/3	2/3	2/-	1/8	1/6	1/7	1/6 1/6
Northern Range to U.K. and Continent	n. 2/6	n. 2/6	2/6	2 1/2	2/1	n. 1/8	n. 1/6	1/9 1/9
North Pacific to United Kingdom (sh. per 2240 lbs) (1)	24/3	24/6	n. q.	n. 23/-	n. 22/8	n. 21/-	n. 24/10	22/3 22/7
Vancouver to Yokohama (1) (Canad. 8 p. sh. ton)	2 25	2 25	2 35	2 35	2 35	2 25	3 10	2 72 2 78
La Plata Down River (3) to U.K./Continent	16/6	17/-	17/6	17/6	17/5	14/4	12/2	10/4 12/8
La Plata Up River (4) to U.K./Continent (shill. per	18 1	18/6	19/-	19/-	19/-	16/-	13/8	18/- 14/4
2240 lbs)	n. q.	n. q.	n. q.	n. q.	n. q.	n. 17/9	n. q.	19/3 n. 15/4
Karachi to U. K. / Continent (5)	29/-	28 6	28/0	29/-	27/8	29/7	25/4	29/8 25/7
Western Australia to U.K./Continent.								
SHIPMENTS OF RICE								
								1930 1929
Saigon to Europe (shill. per	(1)n. 23/9	(1)n. 22/6	(1)n. 22/6	n. q.	(1) n. 20/10	(1)n. 21/2	n. q.	n. 18/11 n. 20/1
Burma to U.K./Continent 2240 lbs.)	25/-	23/9	n. q.	n. q.	n. q.	n. q.	n. q.	n. 17/8 n. q.

(1) Rates for parcels by liners. — (2) The demand for cargoes for Europe has recently been greatly reduced due to the numerous shippings to Shanghai (freight rate, Portland/Paget Sound-Shanghai: Amer \$ 2.85) — (3) "Down River", includes the ports Buenos Aires and La Plata. — (4) "Up River", includes the ports on the Paraná River as far as San Lorenzo. Cargoes from ports beyond San Lorenzo (Colastine, Santa-Fe and Paraná) are subject to an extra rate of freight. — (5) The original data being quoted in "scale terms", 10 % is added to arrive at freights per 2,240 lbs.

EXCHANGE RATES

PERCENTAGE OF PREMIUM (+) OR OF LOSS (—) OF DIFFERENT CURRENCIES IN RESPECT OF THEIR PARITY WITH THE DOLLAR (1).

COUNTRY	Exchange	November 13, 1931	November 6, 1931	October 30, 1931	October 23, 1931
Germany	Berlin	—	0.4	—	0.4
Argentina	New York (2)	—	35.1	—	44.6
Belgium	Brussels	+	0.2	+	0.2
Canada	New York (3)	—	10.1	—	9.8
Denmark	Copenhagen	—	24.9	—	23.6
Egypt	London	—	28.8	—	29.1
France	Paris	+	0.2	+	0.3
Great Britain	London	—	28.8	—	29.1
Hungary	Budapest	+	0.2	+	0.2
India	London	—	21.6	—	21.8
Indo-China	Paris	+	0.2	+	0.3
Italy	Milan	—	1.2	—	1.1
Japan	New York	—	0.5	—	1.6
Netherlands	Amsterdam	—	0.0	+	0.4
Rumania	London	+	0.3	—	0.7

(1) The percentage represents the premium or the loss as far as possible on the national exchange. On the following page may be found the table of reciprocal pairs of the currencies considered; by the aid of this table and the percentages indicated above, it is possible to obtain the reciprocal prices of the different currencies at the rates to which the quotations of the Monthly Review refer. — (2) 16 Oct. - 44.9; 9 Oct. - 51.6; 2 Oct. - 45.7; 25 Sept. - 43.0. — (3) 16 Oct. - 11.0; 9 Oct. - 10.4; 2 Oct. - 13.3; 25 Sept. - 7.8.

RECIPROCAL PARITIES OF THE VARIOUS CURRENCIES IN WHICH ARE QUOTED THE PRICES IN THE MONTHLY AND THE QUARTERLY PRICE REVIEWS (1).

COUNTRIES	Unit of Currency	Germany	Argentina	Belgium	Canada	Denmark	Egypt	France	Great Britain	Hungary	India	Italy	Japan	Netherlands	Poland	Rumania	Czechoslovakia	Former Latin monetary union (3)
Germany	Reichsmark	1	0.561	8.566	0.298	0.889	4.819	6.080	0.979	1.362	0.653	4.526	0.478	0.593	2.123	30.825	8.040	1.235
Argentina	Paper peso	1.782	1	15.203	0.424	1.584	8.686	10.835	1.744	2.427	1.163	8.064	0.851	1.056	3.872	70.959	14.326	2.200
Belgium	Franc	0.117	0.065	1	0.028	0.104	0.563	0.710	0.114	0.159	0.076	0.528	0.056	0.060	0.248	4.619	0.939	0.145
Canada	Dollar	4.198	2.356	35.970	1	3.731	20.230	25.521	1.110	5.718	2.740	19.000	2.006	2.488	8.914	167.181	33.751	5.183
United States																		
Denmark	Crown	1.125	0.031	9.637	0.298	1	5.422	6.840	1.101	1.542	0.731	5.092	0.538	0.667	2.389	44.803	9.045	1.389
Sweden																		
Egypt	Piastre	0.207	0.016	1.777	0.049	0.184	1	1.262	0.203	0.283	0.135	0.939	0.096	0.123	0.411	8.264	1.698	0.250
France	Franc	0.164	0.092	1.400	0.079	0.146	0.793	1	0.161	0.224	0.107	0.714	0.079	0.097	0.349	6.550	1.322	0.203
Indo-China	Piastre (2)																	
Great Britain	Shilling	1.021	0.573	8.760	0.243	0.998	4.923	6.211	1	1.391	0.647	4.623	0.488	0.605	2.169	40.080	8.213	1.261
Hungary	Pengő	0.734	0.412	6.289	0.175	0.633	3.680	4.461	0.720	1	0.479	3.323	0.351	0.435	1.559	26.240	5.903	0.900
India	Rupce	1.532	0.800	13.125	0.365	1.362	7.381	9.316	1.500	2.087	1	0.945	0.732	0.908	3.251	61.020	12.319	1.892
Italy	Lira	0.221	0.124	1.892	0.053	0.196	1.065	1.343	0.216	0.301	0.144	1	0.106	0.131	0.469	8.796	1.776	0.273
Japan	Yen	2.092	1.174	17.024	0.498	1.800	10.064	12.723	2.049	2.850	1.399	9.471	1	1.240	4.443	83.333	16.821	2.583
Netherlands	Florin	1.687	0.947	14.454	0.402	1.460	8.192	10.560	1.652	2.298	1.101	7.647	0.806	1	3.835	67.200	13.567	2.063
Poland	Zloty	0.471	0.204	4.034	0.112	0.419	2.260	2.867	0.461	0.641	0.307	2.131	0.225	0.279	1	18.755	3.786	0.581
Rumania	Leu	0.025	0.014	0.215	0.006	0.022	0.121	0.153	0.025	0.034	0.016	0.114	0.012	0.015	0.053	1	0.202	0.031
Czechoslovakia	Crown	0.124	0.070	1.065	0.030	0.111	0.519	0.746	0.122	0.169	0.081	0.563	0.059	0.074	0.294	4.953	1	0.151
Former Latin monetary union (3)	Gold Franc	0.810	0.455	6.989	0.193	0.720	3.903	4.925	0.793	1.103	0.529	3.006	0.387	0.480	1.720	32.258	6.512	1

(1) Each figure gives the number of units of the currency indicated at the head of each vertical column corresponding to the unit of the currency indicated at the side of each horizontal line. — (2) 1 Gold piastre equal to 10 francs. — (3) Data for purpose of comparison.

LATEST NEWS

U. S. S. R. : On November 14, the sugar beet crop had been harvested on 3,221,000 acres, that is 97.4 % of that planned. In the Ukraine, which is the most important centre for this crop, on November 14 harvesting had been effected on 2,580,000 acres or 97.7 % of that planned and the quantity of beet obtained from this area was 210,322,000 centals (10,516,000 sh. tons) of which 77,162,000 (3,858,000) still remained in the fields. In the Central Black Earth region, of 42,990,000 centals (2,149,000 bushels) harvested on November 14 from 567,000 acres, that is 97.2 % of the plan, there still remained in the fields 19,180,000 (959,000) of beet.

On the basis of these provisional and partial data, production of beet per acre in the present year is about 81.2 centals (4.1 short tons) per acre in the Ukraine and 75.8 (3.8) in the Central Black Earth region, or much below last year's figures. If these provisional and partial data are more or less confirmed by the final total figures, the total production of beet in the whole of the Union in the present year should be considerably below not only that forecast at the beginning of the season for 1931 but also below that of 1930 which gave relatively high yields per acre

MONTHLY CROP REPORT

AND AGRICULTURAL STATISTICS

The following notes refer to crop conditions quoted in the crop reports and in the tables. — Crop condition according to the system of the country: Germany, Austria, Hungary, Luxemburg and Czechoslovakia: 1 = excellent, 2 = good, 3 = average, 4 = bad, 5 = very bad; France: 100 = excellent, 70 = good, 60 = fairly good, 50 = average, 30 = bad; Lithuania, Poland, Sweden and Switzerland: 5 = excellent, 4 = good, 3 = average, 2 = bad, 1 = very bad; Netherlands: 90 = excellent, 70 = good, 60 = fairly good, 50 = below average; U S S. R.: 5 = good, 4 = above the average, 3 = average, 2 = below average, 1 = bad; United States: 100 = crop condition which promises a normal yield. — For other countries the system of the Institute is employed: 100 = crop condition which promises a yield equal to the average of the last ten years.

CEREALS

The estimates of crop results that have arrived at the Institute in December involve some modifications in the calculations made last month of world production, that, though not of great importance in most cases, are worthy of note

WHEAT. — The preliminary estimate of the Argentine crop is practically the same as that forecast by us since October, when a probable production of 220 million bushels was calculated. The official estimate is 219 million. Quality of the wheat, which varied generally from good to excellent, has somewhat deteriorated recently owing to the damp and rainy weather that prevailed during the harvest. In Europe the estimates for Poland and Yugoslavia have been revised, in both cases involving an increase on the preliminary estimates amounting to 13 million centals (22 million bushels) increase or 12 % in all. In this way all the exporting countries of Europe have considerably increased their estimates with respect to the first ones as is obvious from the following table.

Estimate of the 1931 Wheat Crop.

European exporting countries	First estimate	Latest estimate	First estimate	Latest estimate
	million centals		million bushels	
Bulgaria	34.2	36.7	57.1	61.2
Hungary	39.3	41.5	65.6	69.2
Poland	43.7	48.5	72.8	80.8
Rumania	67.5	76.7	112.4	127.9
Yugoslavia	50.8	59.3	84.7	98.8
	235.5	262.7	392.6	437.9

For the United States the final estimates indicate an increase of 2 million centals (5 million bushels) on the previous estimates. For the other continents there are so far no changes worthy of mention; in Australia the crop forecast of 102 (170) millions has been confirmed and the crop is reported to be of good quality. The total world crop is thus increased by 18 (30) millions in respect to the figures calculated a month ago. As this increase has been wholly in the exporting countries it has repercussions on the world export surplus, which, increased by an equivalent amount, now attains 770 million centals (1,280 million bushels) against 750 (1,250) million calculated last month.

Production of Wheat.

COUNTRIES	1931	1930	1929	1928	1927	1926	1925
(Million centals).							
Europe	855	821	871	847	765	732	842
North America	723	760	675	805	822	749	648
Asia	245	273	229	205	236	220	231
Africa	77	72	82	71	71	64	71
South America	165	165	132	243	203	163	143
Australasia	106	132	82	101	77	101	71
Totals	2,171	2,224	2,071	2,362	2,174	2,039	2,006
(Million bushels).							
Europe	1,426	1,368	1,463	1,411	1,275	1,216	1,408
North America	1,205	1,268	1,124	1,492	1,371	1,249	1,080
Asia	410	458	382	342	393	382	386
Africa	130	118	135	118	118	107	118
South America	280	278	220	404	338	272	239
Australasia	175	220	136	160	128	169	118
Totals	3,626	3,708	3,450	3,936	3,623	3,095	3,344

Winter sowings were carried out in Europe regularly and were practically completed at the beginning of December. Germination was uniform almost everywhere and early frost damage was very limited. In some countries, namely France, Great Britain and Ireland and Germany a slight increase in areas sown to wheat is expected in relation to last year, while in others, as Hungary and Rumania, there will be probably slight reductions. On the whole it may be said that even if areas sown to wheat this year do not differ greatly from those of 1930, sowings and first stages of growth have so far been made under better conditions.

In the U. S. S. R. autumn sowings were made under good conditions but did not attain the extent fixed by the five-year plan and areas under wheat and rye seem to be even slightly inferior to those of last year. In North America winter sowings were greatly reduced, though not so much as expected in certain quarters, according to which the reduction on last year should have been about one-sixth. The official report recently received indicates a diminution of 4,470,000 acres, or 10 4 %, in respect to the area sown last winter. The area sown this winter is the smallest recorded in the United States since 1917. The condition of crops toward the middle of December was generally good, save in about one-third of Kansas, the most important wheat-growing State, in which the young plants suffered considerably from lack of rains.

In British India wheat sowings were carried out under good conditions and an increase in area sown seems probable.

In North Africa sowings were delayed by the drought at the beginning of autumn, but were subsequently carried out satisfactorily. Toward mid-December excessive rains and storms caused some losses

RYE. — The latest estimate for Poland involves an increase of about 5 million centals (8 million bushels) on the previous figure ; for Yugoslavia on the other hand there is a slight decrease. The total production of Europe is consequently larger by about 5 (8) millions than was estimated a month ago but still remains one of the smallest recorded

Production of Rye

COUNTRIES	1931	1930	1929	1928	1927	1926	1925
(Million centals).							
Europe	427	518	528	507	455	427	537
North America	22	37	31	32	41	30	31
Argentina	5	3	2	5	4	3	3
Totals	457	558	561	544	500	460	571
(Million bushels).							
Europe	772	926	943	905	813	762	959
North America	39	67	55	58	74	53	56
Argentina	9	5	4	9	7	5	5
Totals	820	998	1,002	972	894	820	1,020

in recent years The United States have further reduced by about 1 (2) millions their already low estimate. The Argentine crop, which has only a slight importance for the world market, is very large, attaining with 5 (9) millions almost twice the level of last year and exceeding the five-year average by about 2 million centals (4 million bushels). The world crop of rye, excluding the U. S. S. R., for which estimates are lacking, remains one of the poorest in the last decade

BARLEY. — The changes made by some of the European countries (Poland, Great Britain and Northern Ireland, Yugoslavia, etc) in their estimates are of small importance

Production of Barley.

COUNTRIES	1931	1930	1929	1928	1927	1926	1925
(Million centals).							
Europe	336	366	397	357	316	323	322
North America	180	212	196	239	176	139	146
Asia (3 countries)	63	65	68	62	64	65	66
Northern Africa (5 countries)	43	44	51	54	44	38	54
Argentina	9	7	8	8	7	9	8
Totals	586	694	723	720	607	574	596
(Million bushels).							
Europe	701	762	827	743	659	674	672
North America	271	441	408	498	367	289	306
Asia (3 countries)	131	135	142	129	133	135	138
Northern Africa (5 countries)	101	92	113	112	92	80	112
Argentina	19	14	16	17	15	16	17
Totals	1,223	1,444	1,506	1,499	1,266	1,196	1,244

and neutralize each other, so that total production has not changed. On the other hand the diminution in the estimate for the United States is considerable and the crop is reduced by a further 4 million centals (8 million bushels). In Argentina the crop, which has, however, only a limited influence on the world market, is abundant and is expected to exceed that of last year by one-third and that of the average for 1925-29 by about one-fifth. It is therefore confirmed that the world barley crop is, like that of rye, one of the smallest of recent years.

OATS — The revised estimates for certain European countries involve as a whole a slight decrease in total production, due principally to a decrease in the figure for the Polish crop. In North America also there was a further decrease, estimated at 9 million centals (20 million bushels) in the already small crop of the United States, which consequently

Production of Oats.

COUNTRIES	1931	1930	1929	1928	1927	1926	1925
(Million centals)							
Europe	556	553	660	602	559	587	546
North America	470	553	489	614	528	529	618
Africa (3 countries)	5	7	7	6	4	4	6
Argentina	21	16	22	21	17	21	26
Totals	1,052	1,129	1,178	1,243	1,108	1,141	1,191
(Million bushels)							
Europe	1,736	1,728	2,061	1,882	1,748	1,835	1,706
North America	1,456	1,728	1,529	1,920	1,650	1,654	1,915
Africa (3 countries)	16	21	22	19	14	12	20
Argentina	65	50	68	65	52	66	80
Totals	3,273	3,527	3,680	3,886	3,464	3,567	3,721

reaches the lowest figure of the last ten years. In Argentina a crop nearly average and exceeding the poor crop of last year is expected.

Summarising, it may be said that the data that have arrived at the Institute in December indicate a slight increase in world production of wheat and rye and a considerable decrease in that of barley and oats.

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Germany : In November the predominantly mild weather in general favoured field work. Winter wheat sowings have been effected on the areas destined to the crop. The situation of the crops is considered to be generally satisfactory. Early sown crops have sprouted well almost everywhere ; in the late sown fields growth is backward compared with normal years and the crops are in some places irregular. At the beginning of December crop condition was as follows : winter wheat : 2.7 (against 2.7 at the beginning of November 1931 and 2.6 at the beginning of December 1930) ; winter spelt : 2.7 (2.8 ; 2.6) ; winter rye : 2.7 (2.7 ; 2.7) and winter barley : 2.6 (2.6 ; 2.6).

Austria : The cold weather which predominated at the end of October continued during the whole of the first week of November. During the second week a rise in

temperature occurred, followed by abundant precipitation. In the latter half of November there was a considerable fall in temperature accompanied by mist. Towards the end of the month snow was reported in the mountains but was abundant only on the southern slopes of the main Alpine chain. Winter sowings were favoured by rather warm weather and sufficient soil moisture. At the beginning of December crop condition of winter cereals was as follows: wheat 2.5 (against 2.6 on November 1, 1931 and 2.2 on December 1, 1930), rye 2.5 (2.5; 2.2) and barley 2.5 (2.5; 2.3).

Belgium. Weather during November was fine and sunny and some rainy days favoured the first sprouting of cereals, at the beginning of December the young plants were already in vigorous condition.

Bulgaria. Winter cereal sowings have been effected under good conditions.

Spain: The rains in November were sufficient and very well distributed and favoured germination of all cereals, which was regular and uniform.

Irish Free State. Autumn sowings were carried out under good conditions. The weather in October and the first week of November was exceptionally favourable and the soil conditions satisfactory. Early-sown crops germinated uniformly and braided evenly and at the close of November were promising.

France. November was generally favourable to sowings and to crops already in the ground, rather rainy and mild, it had, however, some fine days, which favoured operations.

Sowings were everywhere completed under excellent conditions in advance of previous years. They have sprouted well and their appearance in the earlier cases is good. In the first days of December there were, however, complaints that the mild weather had favoured weeds and noxious insects and rodents.

In general the area sown is estimated to be above that of last year and at least equal to the average.

Great Britain and Northern Ireland. While the mild weather of November favoured the growth of autumn-sown crops the general rains in the latter part of the month hindered outdoor work.

Hungary. In the first two weeks of December the weather was very variable. Early in the month there were night frosts, temperature falling to 10°-12°C. Precipitation was normal but the depth of snow was still small.

Amongst winter cereals those sown early have the best appearance; development of later sowings has been arrested, though sprouting has been uniform and insect damage is slight.

Italy: Except in Sicily precipitation during the first half of November was abundant everywhere and in some provinces damaged the sowings. Wheat sowings, which have been finished in many areas, had to be suspended in districts where the weather was excessively wet; germination is normal.

In the latter half of the month, the weather was variable and temperature was falling. Sowings are on the whole normal.

Latvia: In November temperature and precipitation were below normal. There was snow at the beginning of the month but it immediately melted. At the beginning

Cereals.

COUNTRIES	(*) AREA				(**) PRODUCTION							
	1931	1930	Average 1925 to 1929	% 1931/32	1931	1930	Average 1925 to 1929	1931	1930	Average 1925 to 1929	% 1931/32	
	—	—	—	—	—	—	—	—	—	—	—	—
	1931/32	1930/31	1925/26 to 1929/30	1930/1931 = 100	1931/32	1930/31	1925/26 to 1929/30	1931/32	1930/31	1925/26 to 1929/30	1930/1931 = 100	Aver.
	1,000 acres				1,000 centals			1,000 bushels				
WHEAT												
Germany	5,855	4,402	4,067	121.7	131.6	93,829	83,531	71,859	155,545	139,216	119,763	111.7
Austria	507	508	504	99.8	100.6	5,631	7,205	6,786	9,384	12,008	11,309	78.2
Belgium	396	411	375	96.3	105.5	9,153	7,942	8,879	15,255	13,236	14,799	115.8
Bulgaria	2,964	3,006	2,662	98.6	111.3	36,718	34,391	24,285	61,195	57,317	40,474	106.8
*Denmark	259	240	247	104.0	104.8	6,130	6,391	6,229	10,216	10,216	10,382	101.5
Spain	11,245	11,134	10,704	101.0	105.1	80,857	88,021	87,709	134,426	146,689	146,179	91.6
Estonia	99	90	66	109.6	150.6	980	981	605	1,633	1,635	1,099	95.9
Finland	47	51	40	92.7	116.7	696	726	562	1,161	1,210	936	95.9
France	12,494	13,202	13,240	94.7	94.4	161,781	138,673	174,815	269,680	231,118	291,358	116.7
Engl. and Wales .	1,197	1,346	1,491	88.9	80.3	21,526	23,972	20,677	35,877	39,954	49,400	89.8
Scotland	50	54	56	92.8	90.0	1,075	1,277	1,322	1,792	2,128	2,293	84.2
*North Ireland .	3	5	5	67.1	62.7	—	—	102	—	171	178	—
*Greece	—	1,312	1,251	—	—	7,337	7,229	7,334	12,228	12,048	12,223	101.5
Hungary	4,004	4,187	3,821	95.6	104.8	41,513	50,604	47,726	69,186	84,338	79,542	82.0
Italy	12,075	11,917	12,158	101.3	99.3	148,763	126,044	137,524	247,983	210,069	229,203	118.0
Latvia	215	179	139	120.2	154.3	2,101	2,439	1,880	8,502	4,066	2,299	86.1
Lithuania	478	526	352	91.0	136.1	4,894	6,796	3,647	8,156	11,327	6,079	72.0
Luxembourg . . .	23	25	30	89.2	74.8	243	265	344	406	442	573	91.7
Malta	10	9	9	104.8	105.8	160	182	175	277	308	292	91.6
Norway	29	30	25	94.2	113.8	451	432	388	752	720	646	104.4
Netherlands . . .	191	142	135	134.4	141.1	3,761	3,634	3,623	6,268	6,056	6,087	108.5
Poland	4,496	4,066	3,304	110.6	136.1	48,502	49,394	36,305	80,835	82,321	60,508	98.2
Portugal	1,161	1,120	1,071	103.7	108.4	7,226	8,290	6,102	12,042	18,317	10,171	87.2
Rumania	8,566	7,551	7,746	113.4	110.6	76,721	73,464	63,319	127,366	130,770	105,580	97.8
Sweden	684	646	483	105.9	140.2	11,773	12,882	9,381	19,621	21,469	15,635	91.4
Switzerland (I) .	179	180	171	99.6	104.6	3,565	3,461	3,357	5,941	5,769	5,595	103.0
Czechoslovakia .	1,978	1,975	1,860	100.2	105.9	22,991	30,364	28,686	38,317	50,806	47,809	75.7
Yugoslavia	5,390	5,365	4,708	100.5	114.5	50,274	43,197	48,593	98,789	80,326	80,866	123.0
Total Europe . .	73,533	72,122	69,229	102.4	106.7	843,490	805,167	797,040	1,405,739	1,346,920	1,326,390	104.4
*U. S. S. R. . . .	92,369	83,795	71,278	110.2	129.6	—	650,366	477,453	—	1,083,921	795,739	—
Canada (2)	26,116	24,896	23,104	—	—	178,600	238,723	258,428	298,000	397,872	430,704	—
United States . .	54,949	61,138	57,451	89.9	95.6	535,363	514,896	493,279	892,271	858,180	822,115	104.0
Mexico	1,424	1,216	1,281	117.1	113.0	9,467	8,368	6,456	15,778	11,448	10,780	187.8
Total North Amer.	82,483	87,252	81,816	94.5	100.8	723,630	760,487	758,163	1,296,049	1,267,478	1,263,579	916.8
China: Manchuria .	3,920	3,413	2,731	114.8	143.5	35,037	30,515	27,101	58,394	50,857	45,187	114.5
*Korea	—	848	890	—	—	5,370	5,391	5,695	8,951	9,825	10,342	96.6
India	32,181	31,654	31,475	101.7	102.2	208,365	234,506	191,654	347,275	390,843	310,424	88.9
Japan	1,231	1,198	1,174	102.7	104.9	18,536	17,723	17,817	30,892	29,338	29,065	104.6
Syria and Lebanon .	1,168	1,166	1,147	100.1	101.8	8,358	11,133	7,435	13,920	13,555	12,392	76.1
Total Asia	38,495	37,431	36,527	102.3	103.4	270,296	293,877	244,007	450,491	459,793	406,678	92.0
Algeria	3,535	3,680	3,654	98.8	96.8	17,747	19,350	17,790	29,578	32,249	29,499	91.7
*Cyrenaica	18	38	33	48.2	53.2	—	93	119	—	155	198	—
Egypt	1,649	1,522	1,554	108.4	106.1	27,643	23,852	24,030	46,071	39,758	40,049	115.9
Malta	22	—	27	—	—	110	—	61	184	—	101	—
Korea (3)	60	71	57	85.3	106.3	340	389	358	567	648	597	87.5
French Morocco .	2,732	2,957	2,632	92.4	103.8	20,823	12,732	16,553	34,708	21,302	27,558	162.9
Tripolitania . . .	17	12	34	100.0	60.7	46	11	64	—	13	107	—
Tunisia	1,927	1,923	1,719	100.9	112.1	8,378	6,239	7,068	13,962	10,398	11,730	134.3
Total Africa . . .	9,970	10,465	9,550	94.8	102.3	74,979	62,693	65,363	124,963	104,768	109,770	119.7
Argentina (4) . .	17,295	21,293	20,484	81.3	84.4	131,175	141,376	145,819	218,621	235,953	243,026	92.7
Chile	1,426	1,610	1,602	88.6	89.0	—	12,714	17,355	—	21,190	28,758	—
Uruguay	1,154	864	1,056	123.4	106.3	—	4,531	7,335	—	7,218	12,224	—
Paraguay	13,260	13,212	12,797	76.8	109.3	102,000	127,960	81,605	170,000	213,266	138,006	79.7
South West Africa .	276	243	227	112.6	121.8	—	2,900	4,582	—	6,500	7,037	—
Total World . . .	226,623	245,785	236,536	95.6	102.4	2,145,574	2,194,681	2,092,497	3,575,912	3,537,783	3,481,449	97.8
RYE												
Germany	10,739	11,642	11,614	92.7	92.9	147,259	169,397	187,462	262,982	302,317	299,040	87.0
Austria	904	827	946	97.5	95.5	10,280	11,556	11,557	15,322	20,636	20,102	88.8
Belgium	583	574	568	96.8	97.3	11,535	10,433	12,299	21,185	18,660	21,797	112.4
Bulgaria	597	657	481	90.8	124.3	6,760	7,637	8,406	12,672	13,429	7,393	95.7
*Denmark	330	369	448	89.6	73.3	—	5,614	6,946	—	10,099	11,387	—
Spain	1,516	1,551	1,717	97.8	83.3	10,367	12,084	18,554	18,512	21,544	28,347	85.9
Estonia	356	367	354	97.0	100.4	8,133	4,974	3,325	5,667	8,893	6,333	63.7
Finland	554	556	568	99.6	100.1	6,604	7,396	6,712	11,792	14,104	11,665	88.9
France	1,775	1,378	1,953	91.5	90.9	17,568	16,332	19,963	31,013	29,266	35,342	89.9
Engl. and Wales .	33	32	28	103.6	115.4	—	479	439	—	540	731	—

COUNTRIES	(f) AREA					(f) PRODUCTION							
	1931	1930	Average 1925 to 1929	% 1931/32		1931	1930	Average 1925 to 1929	1931	1930	Average 1925 to 1929	% 1931/32	
	—	—	—	1930	Aver.	—	—	—	—	—	—	1930	Aver.
	1931/32	1930/31	1925/26 to 1929/30	1930/1931	1931/1930	1931/32	1930/31	1925/26 to 1929/30	1931/32	1930/31	1925/26 to 1929/30	1930/1931	1931/1930
	1,000 acres					1,000 centals			1,000 bushels				
*Greece . . . . .	..	163	121	...	...	1,016	1,045	863	1,815	1,566	1,549	97.3	117.1
Hungary	1,484	1,611	1,649	92.1	90.0	12,082	15,907	16,836	21,575	28,406	30,064	76.0	71.8
Italy	288	302	307	95.4	93.7	3,469	3,431	3,649	6,195	6,127	6,516	101.1	95.1
Latvia	571	660	627	86.6	91.0	3,133	8,051	5,228	5,595	14,377	9,335	38.9	59.9
Lithuania	1,257	1,197	1,192	105.0	105.4	9,028	14,099	11,412	16,121	25,177	20,379	64.0	79.1
Luxembourg	16	22	17	73.7	96.3	171	209	206	300	480	367	63.8	89.3
Norway	15	19	21	79.9	72.5	301	311	325	538	556	580	96.8	92.7
Netherlands	444	475	489	93.3	90.8	7,350	8,340	8,866	13,125	14,892	15,832	83.1	82.9
Poland	14,262	14,567	14,016	97.9	101.8	124,782	153,399	136,378	222,826	273,923	243,534	81.3	91.5
*Portugal	593	406	433	146.2	121.4	..	2,744	2,464	..	4,901	4,401	...	...
Rumania	1,006	988	720	104.0	139.8	8,810	10,241	5,971	15,747	18,288	10,662	86.1	147.7
Sweden	510	595	741	85.6	68.8	6,834	10,083	10,981	12,204	18,005	19,608	67.8	62.2
Switzerland	46	49	49	92.5	93.5	800	831	912	1,429	1,484	1,623	96.3	87.7
Czechoslovakia	2,493	2,509	2,535	95.9	93.4	23,279	39,409	27,015	50,498	70,374	60,099	71.8	76.4
Yugoslavia	623	626	581	99.6	117.4	4,264	4,382	4,148	7,614	7,825	7,407	97.3	102.8
Total Europe	40,059	41,842	41,080	95.7	87.5	422,943	508,426	480,310	755,253	907,910	857,698	83.2	88.1
*U. S. S. R.	70,086	72,238	66,620	97.0	105.2	...	...	489,038	...	...	873,235	...	...
Canada	778	1,448	794	53.7	97.9	3,207	12,330	7,245	5,883	22,018	12,937	26.7	45.5
United States	3,143	3,543	3,601	88.7	87.3	18,338	25,412	25,832	32,740	45,379	46,129	72.2	71.0
Total North Amer.	3,921	4,991	4,395	76.6	89.3	21,635	37,742	33,077	38,624	67,397	59,066	57.3	65.4
Argentina (4)	1,378	1,822	901	104.3	153.0	5,071	2,646	3,352	9,055	4,724	5,986	191.7	151.3
*Chile	7	8	7	88.7	95.2	..	67	68	...	120	118	...	...
Grand Totals	45,358	48,155	46,376	94.2	97.8	449,649	548,814	516,739	802,947	980,031	922,750	81.9	87.2

BARLEY

Germany	4,001	3,753	3,692	106.6	108.4	66,540	69,059	63,172	138,628	131,873	131,611	105.5	105.3
Austria	422	430	371	98.1	118.8	5,119	5,893	5,237	10,665	12,278	10,611	86.9	97.7
Belgium	70	84	77	83.2	91.8	1,630	1,886	1,894	3,368	3,825	3,947	88.8	86.1
Bulgaria	607	692	562	87.7	108.0	7,949	9,587	5,853	18,560	19,869	12,204	88.3	135.7
*Denmark	387	923	826	95.5	107.3	...	23,170	19,940	48,272	41,542	41,542	...	...
Spain	4,644	4,543	4,456	102.2	104.2	43,548	49,883	44,786	90,727	103,026	93,805	87.3	97.2
Estonia	279	276	235	100.9	98.0	2,705	2,829	2,454	5,636	5,898	5,112	95.6	119.3
*Irish Free State	115	116	131	96.0	87.9	...	2,648	3,001	...	5,517	6,255	...	...
Finland	276	272	273	101.4	100.8	3,086	2,987	3,114	6,430	6,223	6,487	108.3	99.4
France	1,980	1,886	1,776	106.8	110.3	26,307	21,761	24,350	54,807	45,836	50,742	120.9	106.8
Engl. and Wales	1,029	1,020	1,164	100.9	88.4	17,298	16,503	21,524	38,027	34,882	44,643	104.8	60.2
Scotland	88	107	121	83.5	72.6	1,658	2,128	2,438	4,483	4,483	5,088	77.9	68.2
*N. Ireland	1	2	2	68.4	77.9	..	48	40	...	99	84	...	...
*Greece . . . . .	...	529	453	...	...	4,408	3,923	3,249	9,172	8,178	7,768	112.8	135.6
Hungary	1,164	1,131	1,054	102.9	110.4	10,249	13,250	13,118	21,352	27,605	27,380	77.8	78.2
Italy	580	588	577	90.8	91.8	5,289	5,377	5,416	11,020	11,202	11,285	98.4	97.7
Latvia	458	487	438	108.3	104.0	4,431	4,130	3,420	9,232	8,006	7,126	107.8	125.6
Lithuania	474	529	494	89.6	95.9	5,344	5,224	4,831	11,138	10,884	10,065	102.3	119.6
Luxembourg	9	7	6	116.1	101.3	107	99	112	224	206	239	108.7	93.1
Malta (5)	7	7	6	101.4	106.0	137	142	135	285	295	285	96.8	96.8
Norway	188	134	149	108.3	97.1	2,237	2,362	2,966	4,708	4,622	4,622	95.6	95.6
Netherlands	70	78	71	92.3	92.3	1,764	1,939	1,916	3,674	4,040	3,993	91.0	96.8
Poland	3,123	3,048	2,841	102.6	110.1	32,408	32,274	30,767	67,613	67,338	64,668	100.4	100.4
*Portugal	148	171	181	86.9	81.8	...	1,186	870	...	2,887	1,818	...	...
Rumania	4,742	4,881	4,380	97.2	108.8	23,731	52,279	38,233	70,274	108,916	75,497	84.5	95.6
Sweden	218	226	348	96.0	90.6	4,828	5,290	5,719	10,059	11,021	11,616	97.3	97.3
Switzerland	13	16	16	109.2	110.1	295	288	287	615	496	556	124.1	110.1
Czechoslovakia	1,759	1,673	1,709	105.1	99.6	21,819	26,843	28,597	45,446	55,354	59,579	81.2	81.2
Yugoslavia	1,105	1,138	976	97.5	113.3	8,640	8,915	8,502	18,000	18,574	17,879	98.9	108.5
Total Europe	27,230	26,994	25,372	101.1	105.4	267,128	324,782	316,376	629,254	697,496	658,944	81.7	97.2
*U. S. S. R.	13,070	13,417	17,724	92.7	94.3	...	...	134,857	...	...	209,770	...	...
Canada	3,766	5,559	3,297	67.1	87.8	35,637	35,377	59,183	67,978	135,160	104,556	50.8	65.0
United States	41,675	39,222	40,222	99.4	102.3	25,539	24,939	127,301	138,966	204,601	265,000	65.3	75.1
Total North Amer.	45,441	44,781	43,519	98.3	100.1	61,176	60,316	186,484	206,944	339,761	369,556	60.7	72.2
Argentina (4)	1,378	1,822	901	104.3	153.0	5,071	2,646	3,352	9,055	4,724	5,986	191.7	151.3
*Chile	7	8	7	88.7	95.2	..	67	68	...	120	118	...	...
Grand Totals	45,358	48,155	46,376	94.2	97.8	449,649	548,814	516,739	802,947	980,031	922,750	81.9	87.2

COUNTRIES	(1) AREA					(1) PRODUCTION							
	1931	1930	Average 1925 to 1929	% 1931/32	1931	1930	Average 1925 to 1929	1931	1930	Average 1925 to 1929	% 1931/32		
	—	—	—	1930		—	—	—	—	—	1930		
	1931/32	1930/31	1925/26 to 1929/30	1930/1931 = 100	1931/32	1930/31	1925/26 to 1929/30	1931/32	1930/31	1925/26 to 1929/30	1930/1931 = 100		
	1,000 acres				1,000 centals				1,000 bushels				
Algeria	3,199	3,650	3,445	87.6	92.8	14,881	18,327	16,661	31,003	38,188	34,712	81.2	89.3
*Cynenica	82	127	133	64.5	61.3	...	276	772	...	574	1,609	...	...
Egypt	306	345	368	88.7	83.0	4,653	5,043	5,440	9,693	10,506	11,334	92.3	85.5
*Entrea	62	...	58	...	105.9	320	...	166	666	...	346	...	192.3
Trench Morocco	3,156	3,207	3,028	98.4	104.2	24,643	17,995	21,933	51,341	37,491	45,695	136.9	112.4
Tripolitania	99	124	274	80.0	36.0	265	165	609	551	344	1,268	160.0	43.5
Tunis	1,087	1,202	1,243	90.4	87.5	3,968	2,646	4,195	8,268	5,512	8,741	150.0	94.6
Total Africa	7,547	8,528	8,335	92.0	93.9	48,410	44,176	48,333	100,856	92,036	101,750	109.6	99.1
Argentina (4)	1,439	1,422	1,171	101.2	122.8	9,039	6,834	7,961	18,832	14,238	16,587	132.3	113.5
*Chili	144	166	173	86.9	83.4	...	1,860	2,081	...	3,876	5,685	...	...
*Uruguay	12	15	8	78.9	147.2	...	132	64	...	276	133	...	...
*New Zealand	24	25	23	95.0	102.6	...	397	458	...	828	963	...	...
Grand Totals	54,854	58,166	52,963	94.4	103.6	536,249	642,531	597,695	1,117,304	1,338,604	1,245,327	83.5	89.7
OATS													
Germany	8,309	8,499	8,640	97.8	96.2	136,795	124,702	143,893	427,432	389,690	440,664	109.7	95.5
Austria	720	772	757	93.3	95.2	7,346	8,834	9,591	22,956	27,606	29,972	83.2	76.6
Belgium	728	674	678	107.9	107.3	12,986	12,231	15,318	40,561	38,223	47,860	106.2	84.8
Bulgaria	205	345	338	85.6	87.4	2,754	2,437	2,332	8,603	7,616	7,287	113.0	118.1
*Denmark	935	958	1,028	97.7	91.0	...	21,992	21,201	...	68,725	66,254	...	...
Spain	1,058	1,940	1,873	102.3	106.0	13,335	15,990	12,913	41,670	40,995	40,854	83.3	103.3
Estonia	387	368	357	99.6	102.7	3,431	3,478	2,670	10,728	10,870	8,343	96.6	128.5
*Irish Free State	628	844	656	97.5	95.8	...	14,160	14,419	...	44,250	45,060	...	...
Midland	1,149	1,137	1,098	100.1	104.7	14,654	13,287	12,775	45,836	41,438	39,922	110.7	114.9
Finland	8,638	8,587	8,598	100.9	100.5	110,152	98,860	111,902	344,222	302,749	349,690	113.7	98.4
Engl. and Wales	1,632	1,778	1,820	92.9	90.8	27,776	30,036	32,202	86,800	98,663	100,832	92.5	89.3
Scotland	835	862	906	96.9	92.1	13,933	14,493	15,882	43,540	45,290	49,630	96.1	87.7
*N. Ireland	266	307	315	93.1	90.8	...	6,200	6,297	...	19,403	19,678	...	...
*Greece . . . . .	...	350	282	...	...	2,116	1,917	1,568	6,614	5,991	4,900	110.4	135.0
Hungary	596	608	637	98.0	98.7	4,044	5,760	8,235	12,638	17,999	25,734	70.2	49.1
Italy	1,222	1,202	1,243	96.9	96.3	13,331	11,785	13,793	41,658	36,823	43,103	113.1	96.6
Latvia	796	790	740	100.6	107.5	7,822	7,532	5,430	24,631	23,537	17,124	104.6	148.8
Lithuania	900	855	828	105.3	108.7	9,417	8,599	6,846	20,427	20,871	21,394	109.5	137.5
Luxembourg	70	70	72	100.0	97.6	880	880	971	2,749	2,750	3,035	100.0	90.6
Norway	237	239	241	99.0	98.2	3,339	3,459	4,024	10,493	13,621	12,574	76.6	83.0
Netherlands	360	370	377	99.0	97.1	6,067	6,545	7,332	15,860	20,454	22,913	92.7	82.7
Portugal	3,367	5,404	5,007	99.3	102.2	32,091	51,756	51,251	164,637	161,738	160,159	101.8	102.3
Romania	371	420	476	86.5	77.9	...	2,489	1,740	...	7,778	5,436	...	...
Slovenia	2,154	2,636	2,806	80.2	78.8	17,558	25,497	22,518	55,804	79,679	70,363	70.0	79.3
Sweden	1,589	1,620	1,783	97.5	90.1	21,539	25,229	26,111	67,810	79,058	81,565	85.1	82.5
Switzerland	45	48	50	93.9	90.6	851	851	923	2,669	2,659	2,900	100.0	91.7
Czechoslovakia	2,116	2,049	2,078	103.3	101.9	26,526	23,833	30,967	82,893	90,101	96,895	92.0	86.6
Yugoslavia	979	1,037	898	94.4	104.6	5,837	6,233	7,548	18,242	19,634	23,586	92.9	77.3
Total Europe	41,115	41,979	41,893	97.9	98.2	513,454	508,336	545,572	1,604,624	1,582,289	1,704,713	101.4	94.1
U. S. & C.	42,497	44,287	41,262	96.0	103.0	...	...	326,462	...	...	1,020,135	...	...
Africa	13,819	13,550	12,331	96.7	99.9	112,623	143,870	133,308	351,946	449,506	416,533	73.3	84.5
Asia	30,722	39,729	42,554	100.0	93.3	355,886	408,584	421,428	1,112,142	1,277,704	1,181,953	87.0	84.5
Latin Amer.	35,541	32,983	35,335	99.2	94.9	463,058	552,754	554,736	1,464,983	1,727,359	1,733,536	84.8	94.5
Grand Totals	27	28	41	96.5	96.8	182	175	282	570	547	880	104.2	64.7
Algeria	542	638	606	84.9	89.6	3,483	5,300	4,118	10,885	16,561	12,869	65.7	84.5
Trench Morocco	73	103	71	71.6	103.9	755	754	569	2,569	2,357	1,747	100.1	135.0
Tripolitania	99	124	104	78.6	94.7	1,036	661	325	3,238	2,067	2,577	156.7	123.7
Total Africa	714	865	789	82.5	87.5	5,274	6,715	5,052	16,432	20,985	17,193	73.5	96.8
Argentina (4)	3,470	3,987	3,387	85.1	102.5	20,944	15,873	21,273	65,449	49,904	66,468	131.9	98.4
Chili	156	183	193	81.0	80.9	...	1,635	2,160	...	5,109	6,870	...	...
Uruguay	214	179	150	115.9	142.7	...	1,101	868	...	3,440	2,716	...	...
New Zealand	326	322	320	102.2	102.0	...	1,381	1,436	...	4,314	4,639	...	...
Grand Totals	37,867	39,797	39,456	96.1	96.4	1,068,362	1,208,853	1,137,316	3,154,113	3,386,794	3,532,945	93.2	89.6

of December crop condition of winter wheat was average according to 49.3 % of crop correspondents' reports, above average according to 35.7 % and below average according to 15.0 %. The corresponding figures for winter rye were 44.7 %, 40.8 % and 14.5 %.

Lithuania : Weather in November was very favourable especially toward the end of the month. Winter sowings were made under relatively satisfactory conditions but germination was irregular owing to the cold in October.

Poland . Though temperatures were below normal and precipitation was abundant sowings were completed in the greater part of the country under good conditions.

Low temperatures continued till the end of November. The frosts, despite the lack of snow, did not cause any considerable damage to spring sowings, save in the department of Wilno, where damage amounted to 20 %. Crop condition of winter cereals by the system of the country was as follows :

	15-XI-31	15-X-31	15-XI-30
Winter wheat	3.1	3.2	3.5
Winter rye	3.1	3.1	3.6
Winter barley	3.2	3.3	3.5

Crop condition is less satisfactory in the departments of Polesie, Lublin and Wilno, better in those of Tarnopol, Poznanian, Pomerania and Silesia.

Portugal : Regular precipitation permitted good preparation of the land and sowings were made under very good conditions.

Rumania : After some days of rather warm weather towards the middle of November, the temperature fell sharply. During the latter half of November precipitation was abundant and towards the end of the month snow fell throughout the country. During the third week of November field work and winter sowings continued under favourable conditions in most departments.

According to provisional and incomplete data on November 7 there had been sown to winter wheat 4,295,000 acres against 4,791,000 at the same date of 1930. The corresponding data for rye are 546,000 acres against 600,000 and for barley : 143,000 acres against 237,000.

Yugoslavia : Variable and prevalently wet weather in the first three weeks of November hindered the winter cereal sowings but was favourable for germination. In the last ten days of the month, when sowings had been finished in nearly the whole of the country, dry, cold weather set in. Towards the end of the month, snow fell and the cold became more intense, to the detriment of crop condition of the sowings, particularly in regions where they were not so well protected by the snow. According to non-official data, the area sown to wheat shows a reduction while that of barley is somewhat larger.

U. S. S. R. : According to the data of the Commissariat for Agriculture, the area sown to winter crops as on November 10 reached 92,426,000 acres or 87 % of that planned. Of this total area 58 % was sown by the collective farms (kolkhoz) and by the tractor and agricultural machinery stations, 26 % by individual farms and the remainder, 6 %, by State farms (sovkhoz). On November 20 the crop condition of winter cereals was

satisfactory throughout the Union and particularly good in most of the Middle Volga region, the Central Black Earth region and in some areas of the Ukraine, the Rostov-on-Don area and the northern parts of Tver and Nizhni Novgorod. Crop condition was below the average only in a small part of the Saratov and Kurgan regions.

Cereals were at the sprouting stage. The snow, which had spread gradually from the North, where it had fallen in the first half of November, at the beginning of December covered most of the country except in southern parts of the Ukraine, the North Caucasus and other south European and Asiatic parts of the Union.

Work of preparing the soil for spring sowings had, on December 1, been accomplished on an area of 85,628,000 acres, that is, 82.5 % of the plan.

On November 25 the yearly plan for cereal purchases had been carried out to the extent of 73.2 %.

Argentina. The first estimate of cereal production is now known and yields may be considered to be satisfactory. Weather conditions have on the whole favoured the crops. Only in the Pampa have frosts, on November 8 and 9, caused serious damage in about 80 % of the wheat fields. The remaining 20 % afterwards flowered under good conditions. The other cereals were not damaged as the grain was already well formed. In the province of Buenos Aires crop condition of all cereals, with some isolated and unimportant exceptions, remained satisfactory up to harvest time. In the province of Santa Fé there fell during October and the first half of November intermittent and rather abundant rains, which in some regions caused lodging in many fields. The frost caused no serious damage owing to the adequacy of soil moisture.

In the other provinces weather conditions were also in general favourable and damage of limited extent. Quality of cereal crops varies in general from good to excellent. In the provinces of Buenos Aires, Cordoba and Santa Fé many of the fields sown to rye, barley and oats have been grazed. The fields harvested have yielded grain of excellent quality. — (Telegram of December 18) : Cereal yields are satisfactory. Threshing is finished in the north of the country, is advancing in the east and west and has already begun in the south. Hail and worm have caused some small damage. The average yield of wheat is estimated at 75.8 centals (126.4 bushels) per acre.

Canada : Owing to an error in the telegraphic transmission of data from Canada, the figures given in the November Crop Report for winter sowings of wheat and rye this year were incorrect. The correct figures are given below (the years are those in which the crop is harvested) :

	1932	1931	Average 1926-1930	% 1932 = 100	Av. = 100
	—	—	—	—	—
	(thousand acres)				
Winter wheat	518	560	983	92.5	52.7
Winter rye	539	599	731	90.1	73.7

The area under mixed grains in 1931 is estimated at 1,184,000 acres compared with 1,201,000 in 1930 and 1,009,000, the average for 1925-29 ; percentages : 98.6 and 117.3. Production is estimated at 17,343,000 centals against 19,924,000 and 16,154,000 respectively ; percentages : 87.0 and 107.4.

United States : On about November 25 the condition of winter wheat in the eastern and central sections of the belt varied from good to excellent whereas in the western section the weather was cold and rainfall unsatisfactory. In the following week to December 3 the crop made slow progress. On December 9 crop condition was good to excellent except in the western section of Kansas. The Central Lakes region to the Pacific had a varying snow cover. Heavy rains favoured field operations in the Southeast.

The area sown to winter wheat for the 1932 crop is estimated at 38,682,000 acres compared with 43,149,000 last year and the average of 43,162,000 for the preceding five years, percentages: 89.6 and 89.6 respectively. The area sown to winter rye is estimated at 3,712,000 acres against 3,993,000 last year and the average of 3,856,000 for the four previous seasons 1926-27 to 1929-30; percentages: 93.0 and 96.3.

According to a telegram of December 17, almost general rainfall in the winter wheat States has improved the condition of the crops and permitted the resumption of sowing in the Southeast.

Mexico : During October dry, warm weather predominated, especially in the North and North Pacific Coast regions. Only in the southern Gulf area rain fell, favouring preparatory field work and sowings. It is forecast that the area sown this year to wheat will be smaller than that of last year, on the one hand owing to the fall in wheat prices on the world market and on the other to the lack of the necessary soil moisture.

Japan (Telegram of 18 December). Favoured by the weather, germination of wheat and barley was regular.

Palestine : Climatic conditions in November were seasonal and temperatures generally were cool. The mean relative humidity was high, with a few misty nights and heavy falls of dew. Light local showers of no value fell in Southern Palestine. In parts of Northern Palestine falls of rain, with a maximum precipitation of 27 mm. were recorded during the first week of the month. Sowing of winter cereals in unirrigated fields before the coming of the autumn rains, that is *afir* crops, are in full swing under favourable conditions. Sowings of *afir* wheat were made on a larger area than usual.

Germination is irregular since the first rains have been scanty and local. As regards winter wheat cultivation has already begun on holdings possessing mules and modern ploughs. For barley the same remarks hold good.

Syria and Lebanon : Preparations for sowings were made under prevalently favourable conditions save in Lebanon, where conditions were normal.

In Jebel Druze, the data for which are not included in those of Syria and Lebanon, the 1931 crop is considered as average; weather during the season has been on the whole fairly favourable. For wheat the crop was harvested on 105,200 acres against 87,000 in 1930 and 79,400 on the average of 1927-29; percentages 120.9 and 132.4. Production increased to 273,800 centals (456,300 bushels) against 250,900 (418,100) in 1930 and the three year mean of 195,900 (326,400); percentages 109.1 and 139.8. For barley, on the other hand, the results were inferior to those of last year. Area harvested was 27,700 acres against 39,300 in 1930 and 35,900 in 1927-29; percentages 70.6 and 77.3. Production was 58,500 centals (121,803 bushels) against 71,400 (148,800) in 1930 and 49,000 (102,000) in 1927-29; percentages 81.8 and 119.4. Autumn sowings were carried out under average conditions. The lack of rain has made cultivation more difficult.

Algeria : Weather in the first half of November varied as between the different regions. In the department of Algiers alternations of rain and fine weather favoured sowings, which were completed in mid-November; sprouting took place under good

conditions and was regular. On the other hand, in the departments of Oran and of Constantine the drought retarded sowings until the second half of November, in Oran many sowings were made on dry ground; the copious rains at the end of November, however, created favourable conditions everywhere.

Egypt: Weather in November was favourable to sowing, germination and growth. Sowings of early wheat were over by the middle of the month. The area sown toward the end of the month was about 70 % of the whole. Preparatory work and sowings continue in Upper Egypt, where they are ten days in advance of last year owing to the earlier drainage of the basins. The area sown will be greater than last year, especially in Upper Egypt. As regards barley, sowings of the ordinary crop are already over in the northern Delta and in Middle Egypt and continue in the southern Delta and Upper Egypt. The area sown up to the end of November was about 75 % of the total. Condition of early crops is satisfactory.

French Morocco. Rain has fallen in sufficient quantity except in South Morocco and the region of Oudjda. In the area where it has rained sowing has been effected under good conditions.

Tripolitania. After the first rains there was a period of prolonged drought accompanied by high temperatures, which have caused some damage. Sowings were made under average conditions and germination is fairly regular.

Tunisia: November was on the whole favourable to autumn sowings, which were carried out under good conditions in the South and Centre, where barley is principally cultivated and under very good conditions in the north, where the greater part of the wheat is cultivated.

Germination is more or less regular according to region.

Union of South Africa. Drought was relieved toward the end of October by showers, which were of considerable benefit to standing crops. In the Western Province and along the south coast of the Cape Province, however, continuous rainfall caused anxiety in regard to ripening wheat crops and rust had appeared in this area and in other parts of the Union, though up to the end of the month the apparent damage was not serious and record crops were still expected in many areas.

Australia (Telegram of 16 December): Reaping is proceeding under good conditions and results are satisfactory. The previous estimate of production is confirmed. The ears are heavy and well filled.

MAIZE

Now that the complete data for trade in the commercial season 1930-31 (1 November-31 October) are available it is possible to set in relief some characteristics that enable the present features of the market to be more clearly seen.

In the 19 leading countries enumerated in the following table, of which the total import of maize represents on the average more than 96 % of the world import, the volume of imports in 1930-31 reached 222.5 million centals (397.4 million bushels), a quantity only 8.4 (15.0) million below the record of 1926-27 and well over 37.9 (67.7) million above the average of the five preceding years.

*Net imports of maize in the principal importing countries by commercial season
(1 Nov.-31 Oct.) and in the 1st quarter of each season*

	1925-1926		1926-1927		1927-1928		1928-1929		1929 1930		Average 1925-1926/ 1929-1930		1930-1931	
	Quarter Nov.-Jan.	Whole season	Quarter Nov.-Jan.	Whole season	Quarter Nov.-Jan.	Whole season	Quarter Nov.-Jan.	Whole season	Quarter Nov.-Jan.	Whole season	Quarter Nov.-Jan.	Whole season	Quarter Nov.-Jan.	Whole season
(in thousand centals).														
I. Countries producing and importing maize														
1 Italy	2,275	10,992	1,742	8,155	3,042	16,230	7,835	20,276	3,915	15,252	3,761	14,180	3,865	17,445
2 France	4,204	18,018	4,367	17,101	4,195	13,728	6,045	18,409	5,121	17,309	4,786	15,013	5,867	23,473
3 Spain	2,683	8,391	1,455	6,543	1,956	6,978	2,258	6,596	1,918	3,836	2,055	6,468	756	3,666
4 Czechoslovakia . .	2,720	7,366	1,031	8,922	1,973	6,810	1,874	4,989	1,325	5,439	1,967	6,706	2,280	18,122
5 Portugal	317	836	287	1,797	463	1,574	320	1,016	282	1,446	333	1,334	730	1,607
6 Greece	79	437	117	703	84	589	84	602	79	187	88	603	24	375
7 Austria	1,076	3,704	1,129	4,480	1,049	3,450	761	2,527	1,122	4,301	1,027	3,698	1,204	6,270
8 Poland	26	388	190	2,857	348	1,572	110	379	82	386	152	1,116	79	498
9 Switzerland	1,316	3,018	578	3,276	708	2,791	1,023	2,557	769	2,542	877	2,837	948	3,616
10 Canada	1,775	5,924	3,042	9,356	2,189	7,943	2,407	8,076	2,844	7,568	2,452	7,774	1,517	4,755
11 Japan	53	481	77	730	119	747	220	950	377	1,484	170	877	302	1,691
Total	16,523	54,555	14,915	63,920	16,123	62,421	22,937	66,377	17,834	59,750	17,668	61,401	17,552	76,518
II. Countries only importing maize														
1 Great Brit. and N. Ireland	12,073	35,338	10,033	43,198	11,402	37,984	10,329	35,894	9,643	34,152	10,697	37,313	13,741	50,876
2 Netherlands	6,565	20,957	7,915	29,954	8,274	27,623	6,790	22,007	6,411	22,584	7,192	24,626	8,752	32,168
3 Germany	1,506	12,388	7,136	44,161	10,326	31,793	3,929	14,465	5,620	16,510	5,703	23,863	1,786	10,005
4 Belgium	3,657	12,699	4,398	17,203	4,050	13,417	2,595	11,610	3,388	12,683	3,607	13,523	3,552	16,125
5 Denmark	2,357	8,111	3,049	17,390	5,002	16,032	833	3,673	1,583	6,250	2,564	10,291	2,152	13,541
6 Irish Free State . .	1,464	7,086	1,503	8,423	1,484	8,386	2,053	7,987	1,748	8,018	1,651	7,983	2,094	12,017
7 Norway	465	2,414	608	3,172	694	2,857	256	1,689	472	2,676	498	2,562	807	3,979
8 Sweden	386	2,280	483	3,437	1,195	4,826	262	1,687	401	2,264	545	2,899	1,362	7,311
Total	28,473	101,273	35,130	166,998	42,427	142,923	27,047	98,962	29,276	105,137	32,457	123,060	34,246	146,022
GRAND TOTAL . . .	45,006	155,828	50,045	230,918	58,550	205,344	49,984	165,339	47,050	164,887	50,125	184,461	51,798	222,540

(in thousand bushels)

I. Countries producing and importing maize														
1 Italy	4,063	19,629	3,110	14,562	5,433	28,983	13,992	36,207	6,992	27,235	6,716	25,322	6,901	31,152
2 France	7,308	23,247	7,799	30,538	7,492	24,515	10,795	32,873	9,145	30,908	8,547	28,416	10,476	41,916
3 Spain	4,791	14,984	2,598	11,685	3,462	12,460	4,031	11,779	3,425	6,850	3,669	11,551	1,360	6,547
4 Czechoslovakia . .	4,874	13,153	3,449	15,932	3,527	12,177	3,346	8,909	2,366	9,712	3,512	11,976	4,035	23,432
5 Portugal	567	1,492	512	3,209	827	2,811	571	1,815	504	2,589	594	2,382	1,303	2,870
6 Greece	142	779	209	1,256	150	1,051	150	1,075	142	335	157	898	43	669
7 Austria	1,921	6,614	2,016	8,000	1,874	6,161	1,358	4,512	2,004	7,681	1,835	6,594	2,150	11,196
8 Poland	47	693	339	5,102	622	2,807	197	677	146	689	272	1,992	142	890
9 Switzerland	2,350	5,390	1,031	5,850	1,256	4,984	1,827	4,567	1,374	4,539	1,567	5,067	1,693	6,456
10 Canada	3,169	10,578	5,433	16,708	3,909	14,184	4,299	14,421	5,079	13,515	4,378	13,881	2,709	8,492
11 Japan	94	858	138	1,303	213	1,335	394	1,697	673	2,850	303	1,567	539	3,020
Total	29,526	97,417	26,634	114,145	28,795	111,463	40,960	118,532	31,850	106,697	31,550	109,646	31,341	136,640
II. Countries only importing maize														
1 Great Brit. and N. Ireland	21,558	63,104	17,917	77,139	20,361	67,828	18,444	64,096	17,220	60,986	19,102	66,631	24,538	90,851
2 Netherlands	11,724	37,424	14,133	53,490	14,775	49,337	12,125	39,298	11,448	40,329	12,842	43,975	15,629	57,443
3 Germany	2,689	22,121	12,744	78,859	18,440	56,773	7,015	25,830	10,035	29,483	10,185	42,612	3,189	17,865
4 Belgium	6,531	22,676	7,854	30,719	7,232	23,960	4,634	20,731	5,960	22,649	6,441	24,149	6,342	28,794
5 Denmark	4,208	14,484	5,445	31,054	8,933	28,629	1,438	6,559	2,827	11,161	4,579	18,377	3,842	24,180
6 Irish Free State . .	2,614	12,653	2,693	15,149	2,650	14,976	3,665	14,173	3,122	14,318	2,949	14,255	3,740	21,460
7 Norway	381	4,311	1,087	5,665	1,240	5,102	457	3,016	842	4,779	390	4,575	1,441	7,108
8 Sweden	389	4,071	862	6,188	2,184	8,618	468	3,012	717	4,043	962	5,177	2,433	13,055
Total	50,344	180,344	62,735	298,213	75,765	255,223	48,296	176,715	52,171	187,748	57,960	219,751	61,154	260,764
GRAND TOTAL . . .	80,370	278,261	89,369	412,358	104,560	366,631	89,256	293,347	84,921	294,445	89,510	329,397	92,495	397,394

In order of relative importance the first place amongst importers continues to be occupied by Great Britain and Northern Ireland, which absorb little less than one-fifth of the total importation.

The second place is taken by the Netherlands since Germany has become only a moderate importer of maize.

The latter country, which in 1926-27 imported over 44 million centals (79 million bushels), preceding all other countries, had last season the smallest import — 10 (17.9) million — of the last six seasons. Its agricultural policy, for general economic reasons, tends toward the reduction to the smallest possible dimensions of imports of cereals for food and feed. With the decrease of area sown to rye and oats, it has aimed at increasing the area under wheat and barley so as to be able to do with smaller imports of the latter cereals and also of maize; this policy should be connected with the rationalisation of pig-breeding with a view to lowering the number to a level allowing of remunerative prices for pork.

The third and fourth places are occupied respectively by France and Italy, countries that themselves produce maize but not usually in quantity sufficient for requirements, their necessary imports in the last six seasons varying from 24.0 (42.9) million (1925-26) to 40.9 (73.1) million (1930-31) in all according to their own crop. Belgium continues to be a heavy and constant importer of maize due to the general development of its livestock industry and in particular to the very great progress of its poultry industry. It is worthy of note in addition that Sweden has greatly increased its maize imports, which in 1930-31 attained the record figure of 7.3 (13.0) million of which 2.6 (4.7) were imported in the August-October quarter, due to monetary disturbances provoked by the fall in sterling. Czechoslovakia also registered last season its highest figure so far — 13.1 million centals (23.4 million bushels) — with particularly heavy imports in the August-October quarter. This intensification is due to the fall in its barley, oats and maize crops, which are this year below the 1925-29 average by 23.7 %, 14.4 % and 8.7 % respectively.

It is worthy of note that over 34 % of the total import was absorbed in the last quarter of the season, that is from August to October of this year. In previous seasons the first and fourth quarters (autumn-winter) were always those of greatest importance, probably due to the use of maize for feeding principally in winter. A quarterly distribution as discontinuous as in the past season has not been previously recorded.

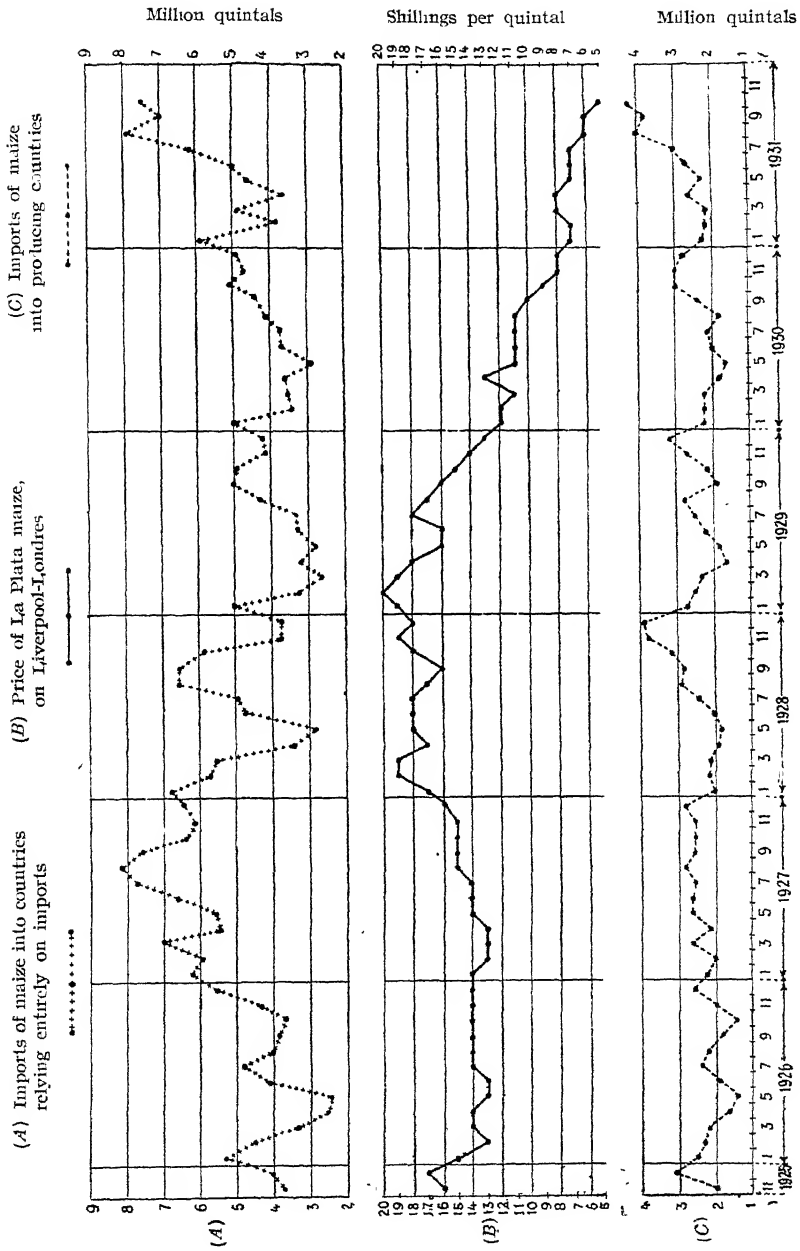
The August-October quarter of this year registered not only the highest percentage of the season's total but also the maximum of the last six seasons.

The cause of this large influx of maize into the importing countries during such a short period may be largely explained by the following factors:

(1) By the fall in maize prices which set in in July 1929 and continued uninterruptedly also during the quarter August-October 1931. The lowest level was reached in October when it corresponded to half the average price for the season 1929-30 and was two-thirds below the average price for the three seasons 1926-27 to 1928-29. The close correlation between the movement of maize prices and the imports of the group of non-producing countries which generally absorb about $\frac{2}{3}$ of the total imports, may be clearly seen in the diagram given apposite. The minimum prices of the quarter August-October 1931 correspond to the maximum imports for these countries. (In the countries importing and also producing maize, consumption seems to show less elasticity and imports, are influenced more by the magnitude of home production than by prices).

(2) By the fact that the fall in prices has been larger for maize than for other fodder crops, particularly oats and barley. From the table at page 753 and from the apposite diagram showing, the relation between the prices of barley and oats and those of maize, it appears that the latter have recently been relatively advantageous to purchasers.

MAIZE IMPORTS AND PRICES FOR LA PLATA MAIZE AT LIVERPOOL-LONDON (B)



(3) By the effects of the fall in value of the pound sterling Owing to the uncertainty of livestock farmers in the importing countries concerning the stability of the respective currencies there has taken place, on a large scale, an "investment in merchandise" so that in the months immediately following the fall in sterling the imports of Great Britain and Northern Ireland and adjacent countries commercially and financially closely related (Netherlands, Denmark and Sweden) have been exceptionally large

Quarterly distribution of Net Imports of Maize into the countries indicated in the preceding table in 1925-26/1930-31

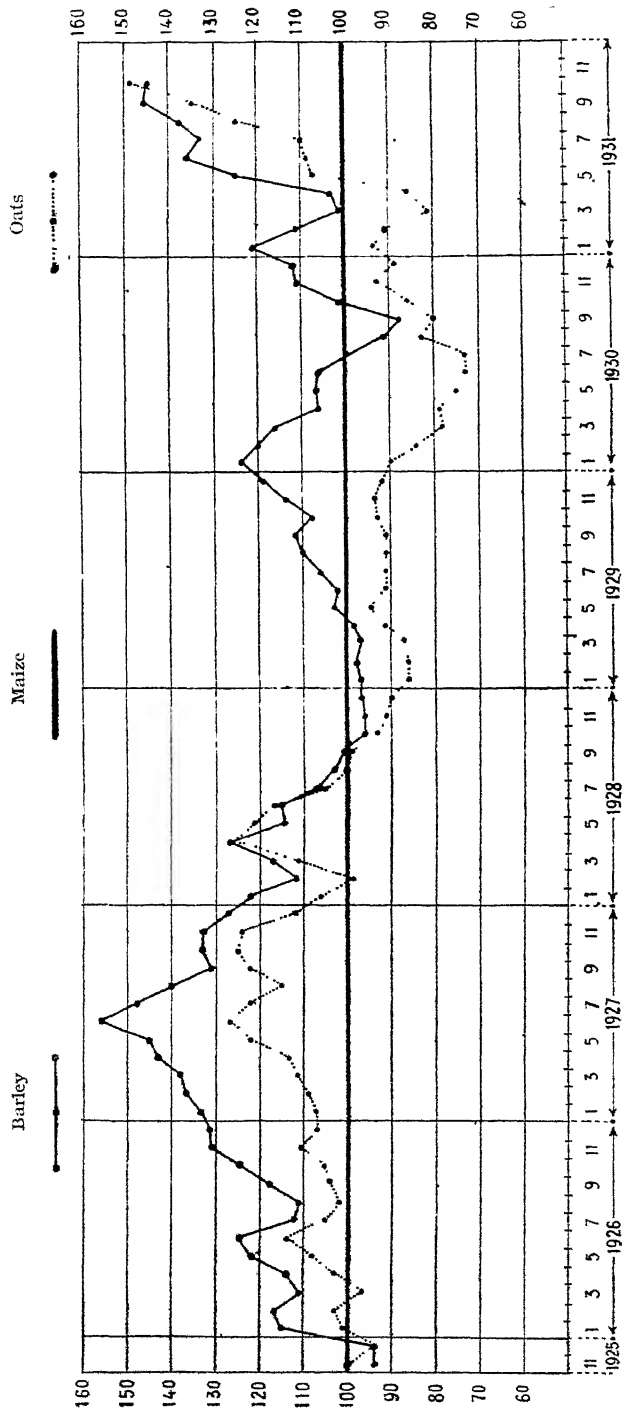
	1925-26	1926-27	1927-28	1928-29	1929-30	1930-31
Total November-October ooo centals	155,826	230,920	205,346	165,336	164,888	222,540
%	100.0	100.0	100.0	100.0	100.0	100.0
IV quarter August-October ooo centals	37,393	65,312	60,795	46,183	46,041	75,892
%	24.0	28.3	29.6	28.0	27.9	34.1
III quarter May-July ooo centals	37,516	60,363	40,799	35,089	35,040	52,470
%	24.1	26.1	19.9	21.2	21.3	23.6
II quarter February-April ooo centals	35,909	55,200	45,199	34,081	36,756	42,380
%	23.0	23.9	22.0	20.6	22.3	19.0
I quarter November-January ooo centals	45,008	50,045	58,553	49,083	47,051	51,798
%	28.9	21.7	28.5	30.2	28.5	23.3
Total November-October ooo bushels	278,260	412,357	366,690	295,244	294,444	397,393
%	100.0	100.0	100.0	100.0	100.0	100.0
IV quarter August-October ooo bushels	66,773	116,629	108,563	82,469	82,217	135,522
%	24.0	28.3	29.6	28.0	27.9	34.1
III quarter May-July ooo bushels	66,993	107,791	72,855	62,659	62,572	93,697
%	24.1	26.1	19.9	21.2	21.3	23.6
II quarter February-April ooo bushels	64,123	98,571	80,713	60,860	65,635	75,678
%	23.0	23.9	22.0	20.6	22.3	19.0
I quarter November-January ooo bushels	80,381	89,366	104,559	89,256	84,020	92,496
%	28.9	21.7	28.5	30.2	28.5	23.3

As regards the prospects for the new commercial season which began on November 1, it should be borne in mind that in Argentina supplies are now greatly reduced as a consequence of the exceptional magnitude of exports from this country in the latter half of the past season : 130.5 million centals (233.1 million bushels) in the half year May 1-October 31, 1931 against a production of 208.6 million centals (372.4 million bushels) of which about 46 (83) is normally absorbed for seed and home consumption.

Exportable supplies of the Danubian countries are on the contrary, considerable : according to information supplied by the respective Governments to the Institute on November 1 they reached in the three principal countries of this group, the following quantities :

	Million centals	Million bushels
Rumania	66.1	118.1
Yugoslavia	9.9	17.7
Bulgaria	6.6	11.8
Total	82.6	147.6

VARIATIONS IN THE PRICES OF CANADIAN N° 3 BARLEY AND 1A PLATA OATS WITH RESPECT TO THE PRICE
OF 1A PLATA MAIZE AT LIVERPOOL, LONDON (PRICE OF MAIZE = 100).



On examination of the table, final exports from the Danubian countries in the last six seasons appear to be very large ; but it must also be recollected (1) that generally not all the quantities exportable are shipped from the Danubian countries within

*Production and exports of maize from Rumania, Yugoslavia and Bulgaria
in the season 1925-26 — 1930-31.*

YEAR	RUMANIA			YUGOSLAVIA			BULGARIA			TOTAL FOR THE THREE COUNTRIES		
	Production obtained in the first year indicated	Exports during		Production obtained in the first year indicated	Exports during		Production obtained in the first year indicated	Exports during		Production obtained in the first year indicated	Exports during	
		first 3 months following the harvest Nov. 1-Jan. 31	12 months following the harvest Nov. 1-Oct. 31		first 3 months following the harvest Nov. 1-Jan. 31	12 months following the harvest Nov. 1-Oct. 31		first 3 months following the harvest Nov. 1-Jan. 31	12 months following the harvest Nov. 1-Oct. 31		first 3 months following the harvest Nov. 1-Jan. 31	12 months following the harvest Nov. 1-Oct. 31
1000 centals												
1931-32	132,278	...	70,945	...	...	21,982	...	...	225,205	...	...	...
1930-31	99,647	5,150	17,756	76,382	2,447	6,420	17,088	1,041	3,477	193,117	8,638	27,653
1929-30	140,792	8,276	23,424	91,441	3,653	12,006	20,724	948	4,017	252,957	12,875	44,447
1928-29	60,763	756	2,433	40,104	37	955	11,351	322	1,373	112,223	1,115	4,766
1927-28	77,892	7,028	15,878	46,485	15	75	11,735	620	1,173	136,112	7,661	17,126
1926-27	123,743	7,134	33,167	75,180	3,413	7,141	15,296	575	2,901	219,224	11,122	48,209
1925-26	91,693	4,925	13,673	83,571	4,026	20,336	14,462	882	2,335	189,726	9,833	36,344
1000 bushels												
1931-32	236,211	...	126,688	...	...	39,254	...	...	402,153	...	...	...
1930-31	177,942	9,196	31,707	136,396	4,370	11,464	30,515	1,853	6,203	344,853	15,424	49,379
1929-30	251,415	14,779	50,758	163,289	6,523	21,440	37,006	1,689	7,173	451,710	22,091	79,371
1928-29	103,515	1,350	4,354	71,615	67	1,705	20,271	575	2,453	200,401	1,992	8,512
1927-28	139,093	12,547	28,333	83,008	28	134	20,956	1,106	2,094	243,057	13,631	30,581
1926-27	229,903	12,740	68,155	134,251	6,094	12,751	27,314	1,023	5,181	391,473	19,362	86,087
1925-26	163,738	8,795	24,416	149,234	7,189	36,314	25,826	1,575	4,169	338,798	17,559	64,899

the commercial year following the harvest as the peasants usually retain considerable quantities as reserves from one season to another ; (2) that home consumption is very elastic in these countries where maize is more or less largely consumed for food by human beings according to the relative abundance of supplies of this product and of wheat and to current export prices for these cereals ; (3) that the quantities of maize obtainable from Argentina until next May, when the new crop of this country will be available, are this year, as has already been noted, exceptionally low, a fact which may facilitate the marketing of larger quantities of Danubian maize until that period ; (4) that the supplies of barley and oats, cereals which may to a certain extent be substituted for maize in the feeding of livestock, are this year very low and are priced relatively highly.

The subsequent movement of the market is in any case greatly dependent on prospects for future production in Argentina, where sowing is being effected under favourable conditions on an acreage probably larger than that of last year

Monthly Prices of « La Plata » Maize, Canadian Barley No 3 and « La Plata » Oats
at Liverpool-London.

Shillings per quintal

	November	December	January	February	March	April	May	June	July	August	September	October
1930-31												
Maize	8	8	7	7	8	8	7	7	7	6	6	5
Barley	8	9	8	8	8	9	9	9	9	8	8	8
Oats	7	7	6	6	7	7	8	7	7	8	8	8
1929-30 :												
Maize	14	13	12	11	11	13	11	11	11	11	10	9
Barley	16	16	15	14	13	13	12	12	11	10	9	9
Oats	13	12	11	10	9	10	9	8	8	9	8	7
1928-29 :												
Maize	19	18	19	20	19	18	16	16	18	17	16	15
Barley	18	18	18	19	19	18	16	16	19	19	18	16
Oats	17	16	16	17	17	16	15	15	16	15	14	14
1927-28 :												
Maize	15	16	17	19	19	17	18	18	18	17	16	18
Barley	20	20	21	21	22	22	21	20	19	17	16	18
Oats	18	18	18	18	21	22	22	21	19	17	16	17
1926-27 :												
Maize	14	14	14	13	13	13	14	14	14	15	15	15
Barley	19	18	18	18	18	19	20	21	20	21	19	19
Oats	16	14	15	15	15	15	17	17	17	17	18	18
1925-26 :												
Maize	16	17	15	13	14	14	13	13	14	14	14	14
Barley	(1) 15	(1) 16	17	16	15	16	16	16	16	16	16	17
Oats	16	16	15	14	13	14	14	14	15	14	14	15

(1) Canadian and American feeding.

* * *

Portugal : Lack of warmth prejudiced regular growth and production is reported to be poor.

Argentina : Towards the middle of November sowings had been completed almost everywhere, favoured by particularly good weather. The general condition of the crops was good. In some northern districts flowering of the first sowings had already begun. In the provinces of Santa Fé, Cordoba and Santiago del Estero locusts made an appearance causing, however, only restricted damage thanks to the steps taken by the Government to distribute widely the means necessary to check their diffusion. The frosts of November 8 and 9 caused no serious damage ; the moisture derived from previous rains and the winds that blew immediately afterwards lessened the ill effects.

United States : At the beginning of November it was reported that the percentage of the maize crop which was of merchantable quality was 85.0 as compared with 78.6 % of the 1930 crop and 80.0 %, the 10-year average of 1920-29. Quality on November 1 was estimated at the high figure of 85.0 against 78.6 in November last year and 79.6, the average of 1920-29.

In the last ten days of November and the first ten days of December, rain, snow and cold delayed harvesting of maize and crops were damaged due to flooding, sprouting and rotting.

Maize.

COUNTRIES	AREA				PRODUCTION								
	1931	1930	Aver 1925 to 1929	% 1931 1931/32	1931	1930	Average 1925 to 1929	1931	1930	Average 1925 to 1929	% 1931 1931/32	1931	
	—	—	—	—	—	—	—	—	—	—	—	—	
	1931/32	1930/31	1925/26 to 1929/30	1930 to Aver.	1931/32	1930/31	1925/26 to 1929/30	1931/32	1930/31	1925/26 to 1929/30	1930 to Aver	1931/32	
	1,000 acres =100				1,000 centals				1,000 bushels of 56 lbs =100				
Austria . . .	148	143	146	103.9	101.7	3,314	2,663	2,490	5,917	4,756	4,447	124.4	133.1
Bulgaria . . .	1,676	1,639	1,671	99.2	100.3	21,983	17,088	14,718	39,256	30,515	26,274	128.6	149.4
Spain	1,052	1,106	1,057	95.2	99.6	14,786	16,152	13,144	26,403	23,844	23,471	91.5	112.5
Hungary . . .	2,735	2,605	2,662	105.0	102.8	32,258	31,021	39,546	57,605	55,394	70,618	104.0	81.6
Italy . . . (s) (*)	3,426	3,490	3,541	98.1	96.7	41,519	62,832	51,754	74,142	112,200	92,418	66.1	80.2
Poland	235	255	218	92.2	107.8	...	2,899	2,013	...	5,176	3,595	...	...
Portugal . . .	243	233	217	104.3	111.7	2,205	1,847	1,940	3,937	3,299	3,464	119.3	118.7
*Portugal . . .	865	868	827	99.6	104.6	...	9,364	7,950	...	16,722	14,196	...	...
Rumania . . .	11,749	10,939	10,606	107.4	110.8	132,278	99,648	99,979	236,211	177,942	178,534	132.7	132.3
Switzerland . .	3	3	3	79.2	78.4	66	64	84	118	114	150	103.4	78.5
Czechoslov. . .	368	364	344	101.2	107.0	4,899	5,479	5,363	8,748	9,788	9,577	89.4	91.3
Yugoslavia . . .	6,158	6,097	5,575	101.0	110.5	70,945	76,381	67,356	126,688	136,395	120,279	92.9	105.3
*U. S. S. R. . .	9,742	9,634	8,336	100.6	118.2	...	...	79,114	...	...	141,275	...	...
Canada	139	161	174	88.3	79.8	3,160	3,263	3,703	5,643	5,826	6,613	96.9	85.3
United States .	104,070	100,743	99,570	104.2	105.4	1,431,843	1,153,704	1,546,016	2,556,863	2,060,185	2,760,751	124.1	92.6
China: Man- churia	2,441	2,139	2,469	114.1	98.9	37,754	35,030	37,848	67,418	62,554	67,586	107.8	99.8
Syria and Leb.	67	61	121	109.7	55.2	770	600	1,370	1,376	1,071	2,446	128.5	56.2
Algeria	20	24	25	81.5	79.7	118	164	144	211	292	257	72.1	82.1
Eritrea	22	22	13	100.0	166.7	132	198	79	236	354	142	66.7	166.7
Kenya (1) . . .	199	206	201	96.4	99.1	2,105	3,299	2,475	3,760	5,892	4,420	63.8	85.1
Fr. Morocco . .	837	649	561	129.0	149.3	2,080	3,354	2,973	3,715	5,990	5,309	62.0	70.0
It. Somaliland .	14	40	39	35.3	38.4	150	530	426	269	946	760	28.4	35.4
Tunis (2) . . .	44	37	45	119.0	99.2	110	132	103	197	236	192	83.3	102.5
*Chilil.	89	92	88	96.7	101.0	...	1,516	1,229	...	2,707	2,194	...	...
Grand Total . .	136,311	130,751	129,040	104.3	105.6	1,862,475	1,513,449	1,891,511	3,218,713	2,703,588	3,377,708	119.1	95.3

* Countries not included in the totals. — s) Late crop («maggengo»). — t) Early crop («cinquantino»). — (1) European crop. — 2) Maize and sorghum.

Mexico : During October dry, warm weather predominated, especially in the North and the North Pacific Coast, where late sowings could not develop satisfactorily. In the other producing regions the crop situation is better, especially in the Central and Gulf States.

In numerous areas of the Centre harvesting of maize has continued and has given satisfactory yields.

Egypt : In November weather favoured ripening. Harvesting is almost finished throughout the country save in the case of late crops, which are still ripening. Normal yields have been obtained. Crop condition on 1 December was 101 against 100 on 1 November 1931 and 101 on 1 December 1930.

Eritrea : Drought and insect damage is reported.

Union of South Africa : Serious drought prevailed practically throughout the Union until late in October, the weather being very hot and windy. Toward the end of the month, however, general rains fell, accompanied in some cases by destructive

hailstorms. The rainfall in inland areas was not, however, sufficient in most cases for ploughing to be resumed and the drought continued in the Natal Highveld. Conditions subsequently greatly improved and very general rains occurred, especially in the Orange Free State and Transvaal and prospects in early November were most promising.

RICE

A considerable amount of information on the current rice crop has now become available and the following is a summary of the principal facts.

Exporting countries. — According to the October estimate the area sown in Burma this year is 12,434,000 acres, a decrease of 2.2 % on the estimate of the same date last year. The final estimates are generally rather above those of October so at least 12 $\frac{1}{2}$ million acres may be taken as the actual figure, as compared with the 12,808,000 actually sown in 1930-31. This would indicate the first reversal of the normal tendency to increase in acreage. The crop, of which harvesting began toward the end of November, was reported to be in good condition and prospects were extremely favourable over the greater part of the country.

In Indo-China full statistics, even for area, are not available, but in Cochin-China, where the crop is harvested mainly in January and February, a 10 % decrease in area is reported — 4,930,000 acres against 5,461,000 in 1930-31; in Tonkin the normal area was transplanted for the crop of the first semester but no information is available regarding the crop harvested in November, which is the more important in the province. These are the two principal exporting provinces. In Annam sowings of the first and second semesters totalled only 2,112,000 acres, a decrease of 23 % and by far the lowest figure of recent years and in Laos this year's estimate is the same as that of last year, 1,161,000 acres, while for Cambodia there is no information whatever. Assuming, as is probable, that the factors producing a decrease in area in Cochin-China and Annam and in checking the normal tendency to increase in Laos have operated in the other provinces, a decrease in area would appear on the whole to have taken place, as was to be expected as a result of the serious financial crisis due to the fall in rice prices. The last reports from Tonkin indicated that the crop of the first semester was average or a little above average. In Annam the production of the first semester was 5,472,000 centals (17,100,000 bushels) against 7,718,000 (24,120,000) last year, a decrease of 29 %; besides a decrease in area there has been serious damage from drought in North Annam, which accounts for about half of the total for the province, and the crop is reported to be mediocre.

Amongst the minor exporting lands Italy, where harvesting operations ended in October, has had a yield below normal, owing to reduction in area and cold weather, Spain has also had a small production, while in the United States larger crops have been obtained both in California and in the Arkansas — Louisiana — Texas region, the estimate for the total crop being now raised to 19,350,000 centals (43,000,000 bushels) an increase of 4 % over last year's and 5 % above the average.

Importing countries. — In India, excluding Burma, there has been an increase in area. The winter rice crop of Bengal, which in the five years ending 1929-30 accounted for 17.5 % of the total rice area of India including Burma, shows an increase of 5 % on the estimate of October 1930; weather was on the whole favourable to tillage, sowings and transplantation and the crop was reported in mid-November to be not less than 95%

of normal with satisfactory prospects. Reaping of the early winter crop was already proceeding in the early part of November. The autumn rice crop of Bengal, which is, however, less important, shows an increase of 21 % in area, which is attributed mainly to the smaller area under jute this year; it is also reported to be not below 90 % of normal. The Bengal winter and autumn crops together show an increase of 9 % in area over the corresponding estimate of last year. In Bihar and Orissa, which is second in importance among Indian provinces as a rice producer, though there has been a slight decrease in the area under autumn rice the increase in the winter crop has more than compensated for this, crop condition is reported to be favourable, the former crop being 94 % of normal, the latter 90 %. In Madras, of which the rice area made up 13.2 % of the Indian total, including Burma, in the five years ending 1929-30, there is an increase of 4 % over the October estimate of last year. Conditions are satisfactory in most districts of the Presidency and production is expected to be about normal, which means that, allowing for the balance of provincial exports and imports, it will probably suffice at least to cover local consumption. The first crop has been harvested in the South and in the West Coast districts of the province and has given normal yields. In India as a whole, excluding Burma, and particularly in the leading producing areas there has, then, been an increase in area sown, while the monsoon, despite a weak beginning, has been a good one and reports indicate good crop condition, so that, when continued depression in export staples and the wheat production still above the average are also taken into account, there seem no immediate prospects of improvement in demand in the Indian market.

In China the prospects are, as usual, more doubtful, owing to lack of precise information. In the Yangtse basin the unprecedented floods of the past summer, which have affected provinces producing probably at least half the total rice crop of China, destroying a large proportion of the young rice at a time when it was too late to replant, are bound to have very greatly affected the supply situation. The crop here has been reported to be well below average, excessive rains having been a further source of damage, but no information is available as to the harvest that has now been made. Low production in the Yangtse area is normally the prelude to increased imports. The question as to how far the situation in this area can be relieved by imports of rice from other areas, in China or abroad, is of considerable importance for the market. A critical factor is that of credits for the supply of food and seed to the 50 millions or more of the destitute population, while the continuance of chaotic conditions makes the situation no easier as regards either production in the unflooded areas or movement of surplus supplies from these to the famine zone. Thus, despite the fact that the potential demand of this area is in all probability larger than ever before, the prospects of a large absorption of supplies from external sources remain doubtful. In the South, where Kwangtung alone is said to produce about one-fourth of China's total crop, it has been reported that an average output was expected, though in both the Canton and Fuchow areas there were destructive floods at the beginning of July, when the second crop is generally transplanted. Stocks in southern centres have been reported to be large.

The Japanese crop, though the area sown actually showed a slight increase, is estimated at 219,386,000 centals (487,514,000 bushels), the lowest figure in recent years and 18 % below that of 1930-31, which was, however, the largest for twenty years. The smaller crop is due mainly to unfavourable meteorological conditions, particularly at sowing and transplanting, when the weather was cold and wet. In Formosa, on the other hand, the first crop, which is that exported to Japan, has exceeded the record of 1930-31, thanks to unusually favourable weather, the continued spread of improved varieties and the better facilities for marketing the product in Japan. In Korea, though the area is only very slightly smaller than last year, there has been a decrease

of 17 % from the large production of that year, but the figure is still much above those of 1928-29 and 1929-30 and 7 % above the average of the five years ending 1929-30.

In Java the irrigated crop, which accounts for about nine-tenths of the production there, is estimated to be 4 % below that of last year and 1 % below the average, while the unirrigated crop is 10 % below last year's rather high figure and still 1 % above the average.

Taking the situation as a whole, it appears that while, excluding Siam, for which estimates are not yet available but in which a considerable diminution in production is probable, the serious crisis in the great rice-exporting lands is reflected in a decline in area sown this year, the position in the principal rice-consuming countries in the immediate future appears unfavourable. Taking into account also the stocks still existing in the exporting and importing countries, the prospect of all the available supplies being absorbed remains, despite the smaller crop of 1931-32, doubtful. Prices remain at the low level registered in the earlier months of 1931, having recovered from the further drop that reached its lowest point in June. Amongst the great exporting countries, Indo-China seems, owing to the fall in sterling, likely to suffer still more severely from the competition of Burma. While, however, there are many doubtful factors in the present situation, further reductions in area in the coming season and an improvement in the purchasing power of the great consuming regions, especially of China, would bring distinct improvement in the market.

C. J. R.

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United States : Quality of the rice crop on November 1 was estimated at 89.2 against 83.5 at the same date of 1930.

Mexico : During October harvesting was general and gave good yields.

India : In the first half of November moderate to heavy rains fell in the greater part of West and East Bengal and light rains elsewhere in the province. The rain damaged crops in places. The reaping of early winter rice was proceeding. In the latter half of November the weather was dry and at the beginning of December it was reported that reaping of winter paddy was progressing freely and a good outturn was anticipated. In Bihar and Orissa variable, mostly light to moderate rains fell in some districts in the first half of the month, while in the latter half the weather was dry. On November 30 crops were in good condition. In Madras Presidency rainfall in the first half of November varied from moderate to heavy while in the remainder of the month it was light to moderate locally; condition towards the end of the month was fair.

Japan : The poor rice crop of the current season is the result of unsatisfactory conditions and especially of the recent unfavourable weather, low temperatures, disease and storms from the end of September to the middle of October.

Syria and Lebanon : Area is 760 acres against 520 in 1930 and 410, the average of the four years 1926-29; percentages 147.6 and 187.9. Production is estimated at 7,500 centals (16,700 bushels) against 7,100 (15,700) in 1930 and the averages of 7,000 (15,600); percentages 106.3 and 106.8.

Rice.

COUNTRIES	AREA					PRODUCTION							
	1931/32	1930/31	Aver. 1925/26 to 1929/30	% 1931/32		1931/32	1930/31	Aver. 1925/26 to 1929/30	1931/32	1930/31	Aver. 1925/26 to 1929/30	% 1931/32	
				1930/ 1931	Aver- age = 100							1930/ 1931	Aver age = 100
1,000 acres					1,000 centals			1,000 bushels of 45 lbs.					
Bulgaria .	14	17	18	84.7	78.7	290	366	329	645	814	730	79.3	88.4
Spain . .	113	120	121	94.2	93.6	5,869	6,892	6,743	13,042	15,316	14,985	85.2	87.0
Italy . . .	346	361	349	96.0	99.3	13,018	14,333	14,652	30,928	31,850	32,559	97.1	95.0
Portugal .	37	36	30	101.7	123.4	..	546	487	..	1,212	972	..	..
Unit. States.	970	959	950	101.1	102.1	20,256	19,935	18,394	45,014	44,299	40,876	101.6	110.1
China: Man- churia . .	495	510	522	97.0	94.8	7,002	6,883	6,781	15,560	15,296	15,069	101.7	103.3
Formosa (1) .	677	660	615	102.7	110.1	14,477	13,892	12,208	32,164	30,871	27,178	104.2	118.6
Korea . .	3,963	3,970	3,885	99.8	102.0	93,437	76,746	59,472	140,968	170,543	132,158	82.7	106.7
India . . .	77,429	74,102	73,766	104.5	105.0	..	1,089,870	1,048,178	..	2,421,886	2,329,230	..	..
Japan . . .	7,952	7,938	7,787	100.2	102.1	219,386	266,620	237,020	487,514	592,477	526,700	82.3	92.6
Java and S	7,742	7,617	7,391	101.6	104.8	103,838	108,312	104,753	230,747	240,688	232,779	95.9	99.1
Madura (1)	1,087	1,188	1,101	91.5	98.7	9,259	10,309	9,204	20,576	22,909	20,453	89.8	100.6

s) Irrigated rice. — t) Unirrigated rice. — (1) First crop

s) Irrigated rice. — t) Unirrigated rice. — (1) First crop

Egypt : Weather conditions in November favoured ripening and harvesting, which is already finished for the early crops whereas it is still in progress for the normal crops. Late crops are just ripening and present a satisfactory appearance. Harvesting of *sefi* rice is finished and yield per acre is slightly below the average, its crop condition on December 1 was 94, as on November 1, 1931 and 100 on December 1, 1930.

POTATOES

Irish Free State : The weather in the first part of November was wet but mild, in the latter part harsh, with heavy rains. The crop was lifted and stored satisfactorily.

Great Britain and Northern Ireland : The crop was lifted under varying conditions, generally not very favourable in England and Wales but satisfactory in Scotland. Yields are below average over the greater part of England and Wales and in Northern Ireland; in the former quality is variable and the prevalence of disease at lifting time and the wet conditions under which part of the crop was clamped are expected to affect adversely the keeping quality, while in the latter quality is very good.

Latvia : According to the reports of agricultural correspondents, quality was average in 46.5 % cases, above average in 46.7 % and below average in 6.8 %.

Lithuania : Thanks to dry weather in October, lifting was carried out under good conditions.

Poland : According to the majority of crop correspondents lifting was effected under good conditions.

Argentina : The frosts of November 8 and 9 have almost completely destroyed the potato crops planted in the province of Mendoza. The Government, with the object of assisting the hardest hit farmers made a gratuitous distribution of 600 tons of seed potatoes.

Potatoes.

COUNTRIES	AREA					PRODUCTION							
	1931	1930	Aver. 1925 to 1929	% 1931 — 1931/32		1931	1930	Average 1925 to 1929	1931	1930	Average 1925 to 1929	% 1931 — 1931/32	
	—	—	—	—	—	—	—	—	—	—	—	—	—
	1931/32	1930/31	1925/26 to 1929/30	1930 to 1931	Aver. 1931 = 100	1931/32	1930/31	1925/26 to 1929/30	1931/32	1930/31	1925/26 to 1929/30	1930 to 1931	Aver. 1931 = 100
	1,000 acres					1,000 centals		1,000 bush of 60 lbs.					
Germany. .	6,979	6,930	6,945	100.7	100.5	955,224	1,088,372	840,606	1,592,009	1,730,585	1,400,982	92.0	118.6
Austria (s)	61	59	46	103.0	131.3	4,442	4,849	3,879	7,404	8,081	6,466	91.6	114.5
Belgium. .	418	407	406	102.6	102.7	47,677	53,642	46,051	79,461	89,401	76,751	88.9	103.5
Belgium. .	402	402	408	100.0	98.4	60,949	65,310	74,752	101,580	108,847	124,584	93.3	81.5
Bulgaria. .	32	35	26	92.9	122.3	1,720	1,852	829	2,866	3,086	1,381	92.9	207.5
*Spain. . .	...	915 (1)	812	...	...	74,499	92,664	(1)83,804	124,162	154,437 (1)	139,670	80.4	88.9
Estonia. .	168	168	166	99.7	100.9	17,399	19,028	15,748	28,999	31,713	26,246	91.4	110.5
*Irish Fr. St.	348	346	369	100.4	94.3	...	52,359	52,714	...	8,285	87,854	...	...
Finland. .	174	175	171	99.3	101.6	15,997	17,314	16,513	26,661	28,856	27,521	92.4	96.9
Engl. & Wal.	447	425	503	105.2	88.9	53,917	61,443	72,272	89,861	102,405	120,450	87.8	74.6
Scotland. .	128	123	144	103.8	89.0	15,658	19,264	21,862	26,066	32,107	36,437	81.3	71.6
*N. Ireland.	134	136	154	98.5	87.4	...	19,134	24,962	...	31,974	41,602	...	...
Hungary. .	710	673	652	105.6	108.9	32,445	40,597	43,333	54,074	67,660	72,221	79.9	74.9
Italy. . .	874	864	888	101.3	100.7	33,136	43,077	43,830	53,226	71,794	75,064	76.9	75.6
Latvia. . .	247	231	201	108.8	122.7	24,247	24,341	17,066	40,410	40,568	28,476	99.6	141.9
Lithuania. .	400	403	347	101.4	117.9	46,297	41,648	32,287	77,161	69,404	58,810	111.2	143.4
Luxemburg. .	40	40	40	99.1	99.3	4,762	3,525	3,818	7,987	5,876	6,393	136.1	124.7
Malta. . .	7	7	7	80.2	97.0	670	644	599	1,117	1,074	999	104.0	111.8
Norway. .	116	117	120	99.8	97.3	18,207	16,868	18,813	30,344	28,143	31,521	107.8	96.3
Netherlands	401	397	432	100.9	92.7	56,699	67,016	73,267	94,496	111,691	122,109	84.6	77.4
Poland. . .	6,715	6,602	6,125	101.7	109.6	724,382	681,282	583,299	1,208,113	1,135,448	972,146	106.4	124.3
Portugal. .	62	66	54	94.0	113.4	6,614	12,454	6,689	11,023	20,756	11,147	53.1	98.9
Rumania (2)	474	468	432	101.2	98.2	52,382	39,993	42,587	87,302	60,654	70,976	131.0	123.0
Sweden. .	327	336	366	97.5	89.4	30,865	39,663	38,039	51,440	66,112	63,397	77.3	81.1
Switzerland	113	120	117	94.2	96.7	16,898	13,007	15,633	28,164	21,878	26,054	129.9	103.1
Czechoslov.	1,779	1,640	1,792	108.4	99.2	189,641	197,324	191,719	316,062	328,867	319,525	96.1	98.9
*U. S. S. R.	14,838	14,378	13,447	103.2	110.1	...	...	962,453	...	...	1,604,057	...	...
Canada. .	581	571	552	101.7	105.2	55,089	43,241	44,747	91,815	80,402	74,577	114.2	123.1
Unit. States	3,382	3,038	3,360	111.3	100.4	225,749	199,926	223,306	376,248	333,210	350,502	112.9	98.9
Syria & Leb.	20	18	14	113.6	144.1	946	1,085	1,027	1,576	1,808	1,711	87.2	92.1
Algeria (s)	27	26	25	104.3	108.0	639	917	924	1,066	1,528	1,540	60.7	60.2
*Chile. . .	101	111	93	91.7	108.8	...	9,861	8,134	16,435	13,556	...	...	...
Totals. . .	25,093	24,341	24,378	103.1	103.0	2,633,151	2,752,700	2,478,624	4,488,511	4,587,754	4,130,955	97.8	108.7

* Countries not included in the totals. — s) Early crop. — f) Late crop. — (1) Average 1926 to 1929. — (2) Unmixed crop.

United States : Quality of the potato crop on November 1 was estimated at 78.8 compared with 82.8 in November, 1930 and 86.4 on the average for the period 1920-1929. Quality is poor this year notwithstanding the small loss from blight and field frost.

Palestine : Preparation of the land is proceeding actively. The crop is steadily increasing in popularity.

Algeria : Rain and the fall in temperature in the latter half of November checked parasite damage.

SUGAR

In the countries which had still not finished the harvesting of beet, pulling and transport to the factories were effected under good conditions at the end of November and the beginning of December. In the U. S. S. R., on the contrary, these operations

Production of Beet Sugar (raw).

COUNTRIES	Production 1 September-30 November				Total production during the season						% 1931-32	
	1931-32	1930-31	1931-32	1930-31	1931-32 (t)	1930-31	Average 1925-26 to 1929-30	1931-32 (t)	1930-31	Average 1925-26 to 1929-30	1930-31	Average 1925-26 to 1929-30
	thousand cents		short tons		thousand cents			short tons			= 100	= 100
Germany	(2) 12,834	(2) 16,398	(2) 841,672	(2) 819,898	33,847	56,162	38,741	1,092,328	2,808,077	1,987,088	60	87
Austria	2,282	1,915	114,060	25,724	3,527	3,313	2,185	176,000	165,620	109,260	106	161
Belgium	—	—	—	—	6,001	6,138	5,949	300,035	306,894	297,449	98	101
Bulgaria	(3) 430	(3) 915	(3) 24,000	(3) 45,745	491	1,204	602	24,600	60,205	30,090	41	82
Denmark	—	—	—	—	2,756	3,699	3,303	138,000	185,000	165,147	75	83
Spain (4)	(2) 895	(2) 1,142	(2) 44,729	(2) 57,115	6,393	6,369	4,813	320,000	318,449	240,838	100	138
Irish Free State	—	—	—	—	176	468	436	8,800	23,390	21,794	38	40
Finland	83	82	4,134	4,070	88	85	69	4,400	4,267	3,441	103	128
France	12,232	12,081	611,608	604,037	19,621	26,557	18,258	980,000	1,327,816	912,883	74	107
Great Britain	4,226	5,557	211,237	277,830	6,504	9,688	4,032	325,000	484,869	201,611	67	161
Hungary	(2) 1,318	(2) 2,243	(2) 65,877	(2) 112,134	3,417	5,154	4,886	171,000	257,712	219,317	66	78
Italy	6,574	8,480	328,706	423,981	7,961	9,382	7,039	398,000	469,000	351,967	85	113
Latvia	—	—	—	—	287	132 (5)	204	14,800	6,625 (5)	10,185	216	141
Netherlands	(2) 1,239	(2) 2,057	(2) 81,930	(2) 102,854	3,558	6,359	6,212	193,000	317,958	810,675	61	62
Poland	(2) 3,333	(2) 4,823	(2) 166,664	(2) 241,395	12,885	17,099	15,045	644,258	354,957	752,221	75	86
Rumania	—	—	—	—	1,923	3,620	2,745	70,000	181,010	137,238	87	48
Sweden	3,153	4,112	157,629	205,618	3,158	4,112	2,681	158,000	205,618	144,022	77	108
Switzerland	—	—	—	—	132	126	152	7,000	6,900	7,600	105	87
Czechoslovakia	17,023	21,636	851,161	1,081,799	17,481	25,173	26,016	874,021	1,253,614	1,800,763	69	67
Turkey	—	—	—	—	353	214	101	18,000	10,700	5,025	165	351
Yugoslavia	(2) 739	(2) 1,418	(2) 36,947	(2) 70,904	1,842	2,264	2,082	92,104	113,198	104,109	81	88
Europe, totals . . . a	—	—	—	—	132,096	187,317	145,251	6,608,846	9,365,870	7,282,406	71	91
U S S R	—	—	—	—	40,234	38,283	24,066	2,012,000	1,914,400	1,208,288	105	167
Europe, totals . . . b	—	—	—	—	172,330	225,605	169,317	8,620,846	11,280,270	8,465,694	76	102
Canada	—	—	—	—	1,058	1,075	769	53,000	53,763	38,435	98	138
United States	—	—	—	—	22,120	25,979	21,426	1,106,000	1,299,000	1,071,390	85	103
Totals, North America	—	—	—	—	23,187	27,054	22,197	1,159,000	1,352,763	1,109,823	81	98
Korea	—	—	—	—	22	22	13	1,100	1,109	635	99	174
Japan	—	—	—	—	601	532	545	30,030	26,583	27,231	113	110
Asia, totals	—	—	—	—	623	554	558	31,130	27,692	27,866	112	112
Australia	—	—	—	—	114	75	48	5,706	3,752	2,416	152	239
General totals . . . a	—	—	—	—	156,626	215,660	168,654	7,804,682	10,750,077	8,402,513	73	93
General totals . . . b	—	—	—	—	196,254	253,288	192,130	9,816,682	12,664,477	9,565,801	77	102

a) Not including U.S.S.R. — b) Including U.S.S.R. — (1) Approximate data. — (2) To the end of October. — (3) To November 15th. — (4) The season begins on 1st July — (5) Average 1928-29 to 1929-30.

encountered some difficulties ; in the absence of precise information, the figure of production published in the table last month has not, however, been changed.

In the table of beet sugar production have been added the data of production of Korea, Japan and Australia.

Compared with the average, the production of these three countries is increasing; that of Japan and Australia also shows an increase on last year whereas the Korean production nearly equals last year's figure.

Now that data are possessed for these three countries, it is possible to calculate the world production of beet sugar.

If the figure for the U. S. S. R. is included in the total of world production, the latter shows a decrease of 23 % compared with the figure for last season but an increase of 2 % on the average of the five preceding seasons. If, on the contrary, the U. S. S. R. is excluded, there are noted decreases of 27 % and 7 %, respectively.

As regards cane sugar, the absence of data has not permitted the compilation of

a production table containing a sufficient number of figures especially as there is still no estimate to hand of the most important Cuban production ; the Cuban Senate has, in fact, postponed until January 10, fixing the date on which the manufacturing season is to begin and the quantity of sugar to be produced

Although no definite figures can be given, however, the information possessed on crop condition, area planted and production in the countries in which harvesting is in progress permit the rough estimate that production of cane sugar in the season 1931-32 will nearly equal that of the preceding season or will be a little smaller.

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* *

Austria. Toward the middle of November lifting had everywhere been completed. On 1 December crop condition was 2.6 against 2.7 on 1 November this year and 2.5 on 1 December 1930.

Irish Free State : No serious damage by weather, insect pests or disease has occurred. The crop was being lifted and delivered to the factory during November, but sugar manufacture was not expected to commence before the end of the month.

France: The last cartings of beet were made in the first days of December, in advance of last year.

Great Britain and Northern Ireland. In November lifting was practically completed, despite the rain toward the end of the month. The crop was below average, the roots being small and in some areas fanged, but sugar content was higher than in 1930.

Sugar-beet.

COUNTRIES	AREA						PRODUCTION							
	1931	1930	Aver. 1925 to 1929	% 1931		1931	1930	Aver. 1925 to 1929	1931	1930	Aver. 1925 to 1929	% 1931		
				1930 = 100	Aver. = 100							1930 = 100	Aver. = 100	
I,000 acres						I,000 centals		I,000 short tons						
Germany	941	1,194	1,063	78.9	88.6	233,664	328,900	237,119	11,683	16,445	11,856	71.0	98.5	
Austria	106	88	62	121.1	171.4	23,534	21,457	13,724	1,177	1,073	686	109.7	77.5	
Belgium	140	140	162	100.0	86.4	37,619	41,128	40,705	1,876	2,066	2,035	91.2	92.3	
Bulgaria	37	49	35	76.0	106.1	5,291	6,889	4,247	265	344	212	76.3	124.3	
*Spain	197	181	181	100.0	100.0	65,295	51,197	34,872	3,255	2,580	1,744	127.5	187.3	
Finland	5	3	5	161.6	96.3	794	683	773	40	34	39	116.1	102.7	
England and Wales	233	347	162	87.1	144.0	44,800	63,130	28,306	2,240	2,467	1,415	65.3	155.5	
Scotland	1	2	4	57.4	26.1	114	269	442	6	13	22	42.5	25.0	
Hungary	142	183	163	77.3	84.5	22,743	32,239	32,947	1,187	1,670	1,647	70.6	85.9	
Italy	270	277	226	97.7	119.3	52,363	67,219	51,465	2,613	3,361	2,573	77.3	103.6	
Netherlands	91	142	157	64.2	58.1	22,346	47,127	46,341	1,117	2,356	2,317	47.4	48.3	
*Poland	389	457	530	58.1	74.4	103,903	92,177	92,177	5,200	4,809	4,809	106.5	106.5	
*Rumania	50	113	167	48.9	29.7	13,708	24,143	24,143	985	1,807	1,807	74.1	106.5	
Sweden	91	91	78	100.0	113.9	13,342	26,787	19,235	963	1,339	962	72.7	97.7	
Czechoslovakia	461	564	675	83.3	63.3	102,572	141,567	157,619	5,144	7,078	7,681	72.7	97.7	
U. S. S. R.	2,332	2,533	1,630	141.8	194.4	374,787	334,434	193,563	13,739	14,721	9,312	119.1	104.1	
Canada	53	62	48	86.3	114.6	10,096	9,426	5,635	504	477	434	107.6	107.6	
United States	2,279	725	515	100.0	100.0	185,393	123,233	147,133	2,232	1,401	1,365	100.0	100.0	
Australia	39	39	39	100.0	100.0	5,621	1,622	1,621	45	51	23	100.0	100.0	
New Zealand	39	39	39	100.0	100.0	5,621	1,622	1,621	45	51	23	100.0	100.0	

Lithuania : The early frosts were unfavourable.

Poland : The majority of crop correspondents report that lifting has been carried out under good conditions.

U. S. S. R : Owing to the considerable delay both in lifting and transport to the factories the Government has taken a series of measures to accelerate movement. Toward the end of the first decade of December the beet fields were already covered with snow, under which were 71 million centals (3.5 million short tons) of beets. There had been transported to the factories by the end of the first decade of December only 197 million centals (9.8 million bushels) out of 267 (13.3) pulled.

United States . On November 25 gathering of sugar-beet had been largely finished. According to the November Crop Report yield per acre of sugar-cane is low this year (15.2 short tons per acre) compared with previous years (17.1 in 1930, 18.8 in 1929 and 16.2 in 1928) as the Louisiana cane failed to overcome the adverse conditions of the early part of the season.

Although the sugar content of beets is reported to be quite satisfactory in the Great Plains area, it apparently will not be much above the average for the country as a whole. Favourable weather in October improved the beets in both yield per acre and sugar content.

During the week ended on November 25 the sugar-cane harvest in Louisiana was delayed.

The sugar-cane area this year is estimated at 153,000 acres against 149,000 in 1930 and 132,000 on the average for 1925-29, percentages 102.7 and 115.7. Production of cane is estimated at 46,520,000 centals (2,326,000 sh. tons) compared with 51,180,000 (2,559,000) in 1930 and 43,524,000 (2,176,000) the average; percentages 90.9 and 106.9, corresponding figures for cane-sugar production are 3,120,000 centals (156,000 sh. tons), 3,674,000 (184,000); 1,911,000 (96,000), 84.9% and 163.2%.

Guadeloupe : Production in 1931-32 is estimated at 816,000 centals (40,800 sh. tons) against 375,000 (18,700) in 1930-31 and 542,000 (27,100), the average of the five years ending 1929-30. Percentages 218 and 150.

Mexico : The crop situation is good in the principal producing States. In many areas the area cultivated has been reduced owing to low world prices for the product.

India : Practically no rain fell in November in the United Provinces and on November 28 standing crops were doing well and prospects were favourable. November weather was dry in the Punjab and at the end of the month condition was average to good. In Bihar and Orissa variable mostly light to moderate rains fell in some districts in the first half of the month while in the latter half the weather was dry. On November 30 crops were in good condition.

Java : The experimental station of the sugar industry intimated on 7 December that weather in the latter half of November was dry. Almost all reports regarding crop condition of the new plantings are favourable though on heavy lands final earthing up is a little late due to drought.

Egypt : November weather conditions favoured the development and ripening of the crops. Early varieties are almost completely ripe. In some regions cutting is

in progress for local consumption and the production of molasses in local mills Cutting of cane for the sugar factories, which begin to operate towards December 25, will commence during the last ten days of the month. Yields are slightly above the average. Crop condition on December 1 was 102, as on November 1, 1931 and on December 1, 1930.

Union of South Africa: October crop condition averaged 22 % below normal. The weather was dry, with hot winds along the north coast of Natal and in Zululand.

VINE

Information received since last month only confirms our forecasts of a crop in the northern hemisphere between 3,300 (4,000) and 3,500 (4,200) million gallons. Almost every where the quality of the wines this year is promising and generally above expectations, thanks to the favourable weather. On the whole, if account is taken of some 580 (660) to 660 (790) millions of stocks distributed amongst the various producing countries the viticultural season will begin with supplies very much above requirements for consumption.

The 1930 crop was moved under very satisfactory conditions as the majority of exporting countries, France and Greece excepted, found external markets:

TABLE I. — *Export of wine from the principal exporting countries.*

Season 1 October-30 September.

EXPORTING COUNTRIES	1930-31	1929-30	1928-29	1927-28	1926-27	1925-26
(Thousand Imperial gallons) *						
North Africa (Algeria-Tunisia)	271,494	239,905	226,091	164,102	170,173	222,881
Spain	94,325	66,169	95,821	119,117	106,798	68,389
Italy	33,056	20,568	20,986	21,338	22,218	24,153
France	19,182	25,781	30,423	30,071	31,654	39,640
Greece	11,417	20,326	32,160	21,250	33,458	20,882
Hungary	7,127	6,819	5,455	1,056	1,628	1,100
Yugoslavia	3,344	946	1,078	1,298	858	264
Total } not including North Africa	173,451	140,609	185,923	194,130	196,614	152,378
} including North Africa (1)	444,945	389,514	412,014	353,232	366,787	375,059
Crop of northern hemisphere	3,103,854	3,672,711	3,711,427	3,253,218	2,682,865	3,846,096
% of crop exported	15.3	11.1	11.9	11.8	14.5	10.6
(Thousand American gallons)						
North Africa (Algeria-Tunisia)	326,040	288,105	271,515	197,071	204,363	267,420
Spain	113,276	79,463	115,073	143,048	128,255	79,727
Italy	45,702	24,700	25,202	25,625	26,682	29,006
France	23,038	30,961	36,535	36,112	38,014	47,604
Greece	13,710	24,409	38,622	25,519	40,180	25,017
Hungary	8,559	8,189	6,551	1,268	1,955	1,321
Yugoslavia	4,015	1,136	1,294	1,559	1,080	317
Total } not including North Africa	208,298	163,858	223,277	233,131	236,116	182,992
} including North Africa (1)	534,338	456,963	494,792	430,202	440,479	450,412
Crop of northern hemisphere	3,727,450	4,410,596	4,457,090	3,906,822	3,221,880	4,618,815
% of crop exported	15.8	11.1	11.9	11.8	14.5	10.6

(1) About 95 % of the exports from the northern hemisphere

Markets were furnished to them by France only, the non-producing countries having, on the other hand, reduced their imports.

TABLE II — *Imports of wine into the principal importing countries.*
Season 1 October-30 September.

IMPORTING COUNTRIES		1930-31	1929-30	1928-29	1927-28	1926-27	1925-26
Thousand Imperial gallons,							
France	{ from North Africa . . .	269,734	233,365	223,803	160,032	165,070	219,580
	{ from other countries . . .	93,820	32,836	63,947	90,058	62,803	27,035
Switzerland		25,781	24,725	27,541	26,991	27,167	31,434
Germany		16,278	19,688	26,991	29,521	28,949	11,967
Great Britain and N. Ireland		14,100	14,188	14,342	13,528	17,818	16,366
Belgium		8,337	9,151	9,613	9,019	10,531	14,408
Austria		6,907	9,041	9,217	11,395	8,051	6,585
Czechoslovakia		4,004	5,895	6,665	6,819	5,169	4,619
Total	{ General (1)	438,961	353,939	382,119	347,363	325,608	332,294
	{ not including total imports into France (2)	75,407	82,638	91,369	97,273	97,735	55,679
(Thousand American gallons)							
France	{ from North Africa . . .	323,926	286,255	268,767	192,184	198,234	263,695
	{ from other countries . . .	112,669	39,494	76,794	108,152	75,421	32,467
Switzerland		30,961	29,693	33,074	32,414	32,625	37,750
Germany		19,549	23,643	32,414	35,452	34,765	14,371
Great Britain and N. Ireland		16,933	17,039	17,224	16,247	21,398	19,654
Belgium		10,012	10,990	11,544	10,831	12,707	17,303
Austria		8,295	10,857	11,069	13,684	9,669	8,269
Czechoslovakia		4,803	7,030	8,004	8,189	6,208	5,548
Total	{ General (1)	527,153	425,861	458,890	417,153	391,027	399,457
	{ not including total imports into France (2)	90,558	99,302	113,329	116,817	117,372	102,395

(1) About 85 % of total world imports

(2) About 65 % of world imports not including those of France.

Outside France only Switzerland and Great Britain maintained their imports, but the latter absorbed a larger quantity of Australian and South African wines, their imports of European wines showing a distinct falling off. Italy, Spain and Portugal were able, therefore, to market their output, small as it was, thanks only to the abnormal demand of the French market. This demand was not, however, the result of a poor crop, for, with the inclusion of Algeria, national supplies were quite sufficient for internal consumption, but the result of a large margin between prices of French and of foreign wines. For the time being, though it has not disappeared, this margin has been considerably reduced and is, in any case, inferior to the customs duty, which has been reduced by recent commercial agreement to 53 francs per hectolitre in the case of quotas of Spanish and Italian wines. On the other hand, it is to be expected that Switzerland the chief outlet of Italy, will not maintain its imports at the level at which they have been for some years.

Italy, like Spain, has only reduced stocks and supplies at the beginning of the season were in both cases relatively small. It is, however, to be feared that with the probable decrease in internal consumption and in exports, these supplies will only with difficulty be moved. The superiority of supplies over demand is still more marked in France. It may be estimated that total supplies, including the 290 (340) to 310 (370) million gallons of Algerian and Tunisian wines, attain nearly 1,870 (2,240) million gallons, to which must be added the 45 (50) to 65 (80) million of the preferential quota from Spain, Italy and

Greece. But consumption last season scarcely exceeded 1,300 (1,000) million gallons. If the fact be taken into account that the fall in prices will compensate for the restriction of commercial consumption due to the economic crisis an increase can hardly be expected. At the most it may be expected that higher duty-free family consumption will be sufficient to carry total consumption to 1,430 (1,720) at the most. Franco-Algerian supplies are thus distinctly superior, by nearly 440 (530) million gallons, to the needs of consumption.

In the other producing countries the situation is scarcely better. The exporting countries, such as Yugoslavia and Hungary, which have in recent years considerably developed their exports are faced with difficulties due to the exchange and to the general crisis. Besides, stocks in all the Danube and Balkan countries, Greece excepted, are very abundant. The same applies to Central Europe, here, too, supplies are superior to internal consumption and export needs.

In brief it may be said that during the last season the general restriction of imports into the majority of importing countries and the probable limitation of consumption in the exporting countries have been largely compensated for by the special situation of the French market, where prices were relatively very high so that it was possible to market a relatively poor crop.

This last factor tends to disappear, the margin between the prices of foreign and French wines being very much below the normal customs duty of 84 francs per hectolitre and for the time being distinctly below the reduced duty of 54 francs. Besides, the restriction of consumption in all countries cannot but be accentuated. Consequently marketing of the 1931 crop, equivalent, if Franco-Algerian production is excluded, to that of 1930, will be difficult.

The season has begun quietly, owing almost everywhere to the fall in prices, the resistance of growers and the general slackening in business: in addition, in France, stocks weigh heavily on the market.

Wine prices have fallen considerably since July. In France from 175 francs in July the price per hectolitre of 9° red wine on the holding passed to 154 in August, 115 in September and 91 in October, with a further fall of one or two francs in November, finally becoming stable at around 90 francs in December, with alternative weaker and firmer tendencies. In Italy and Spain, where prices were much lower, the fall has been less heavy. On the Milan exchange the fall between July-August and November was 5 to 7 lire per hectolitre; in November prices of ordinary wines rallied strongly and at the end of the month were for red wine, type A, 10°, 57 lire, red wine type B, 13.5°, 72.50 lire, white wine, type C, 11°, 62.50, white wine, type D, 14.5°, 74 lire. At the beginning of December prices for types C and D rose a further few points.

In Spain prices of red wines on the Valencia market fell from 40 pesetas per hectolitre to 30 pesetas in October and remained at this level till the end of November. The tendency is firm.

It will thus be seen that prices of French wine have returned to the level of the international market, which is relatively low. Prices of wines from Danubian countries remain very low.

In the southern hemisphere, despite a very mediocre crop in 1931 in Australia, South Africa and Argentina, the crisis intensified seriously; stocks are very large; the British Dominions have with difficulty maintained their exports at the level of last year. Prices are low.

The 1932 crop in Argentina has been seriously damaged, so that it will be possible to market not only the heavy stocks existing in that country but also those of neighbouring countries, especially Chile.

P. de V.

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Austria : On 1 December crop condition was reckoned at 2 3, as on 1 November of this year, against 2 0 on 1 December 1930

France : The crop declarations of the four leading wine producing departments confirm the forecasts given last month of a crop between 1,232 and 1,276 million Imperial gallons (1,479 and 1,532 American gallons).

In evaluating stocks on holdings at the beginning of the season there must be taken into account the fact that stocks in the four departments indicated are nearly 22 (26) million gallons below those of last season, so that it may be considered that total stocks in growers' hands are between 1,298 (1,559) and 1,364 (1,638) million gallons, figures equal to the supplies in 1928-29, 330 (396) to 374 (449) million gallons above that of last season and inferior only to those of 1929-30 and 1925-26

Vines.

COUNTRIES	AREA					PRODUCTION											
	1931	1930	Aver.	1931		1931	1930	Aver.	1931	1930	Aver.	% 1931					
			1925	1930	Aver.			1925			1930	1925	1930	1930	Aver.		
			to													to	to
			1929														
1,000 acres			= 100 = 100			1,000 Imperial gallons		1,000 American gallons			= 100 = 100						
Germany. .	204	203	201	100.5	101.4	...	61,895	35,549	...	74,331	42,691	...	...		
Austria (1).	78	77	80	101.0	96.8	29,565	28,450	12,738	35,505	31,764	15,297	111.8	...				
Bulgaria. .	217	205	189	106.0	114.8	61,769	57,744	33,235	74,179	69,345	39,912	107.0	232.1				
Spain (2). .	...	3,495	3,429	...	...	336,504	400,972	518,520	476,166	481,531	622,006	98.8	185.9	
France (3). .	...	1,113	1,077	...	...	613,862	421,659	579,073	737,193	509,977	695,414	144.6	106.0	
Greece (2). .	...	375	277	...	...	35,482	30,397	56,953	42,611	36,504	68,401	116.7	62.3	
Italy (s) .	1,955	1,946	2,078	100.5	94.1	...	798,903	906,147	...	953,411	1,088,201	...	...		
(t)	8,383	8,526	8,567	98.4	97.9	...	...	...	...	...	...	...	...
Luxemburg.	3	3	4	100.0	84.5	1,936	844	1,063	2,325	1,014	1,277	229.3	132.1				
Portugal. .	863	...	856	...	101.4	148,483	129,612	132,445	178,315	155,652	159,054	114.6	112.1				
Switzerland	...	33	35	...	...	14,953	14,073	12,282	17,964	16,907	14,750	106.2	121.3		
Czechoslov.	47	44	42	105.5	111.4	...	10,427	4,864	...	12,521	5,841	...	...		
Syria and Lebanon.	125	126	123	90.2	101.6	—	—	—	—	—	—	—	—				
Algeria . .	729	671 (4)	595	103.7	122.4	321,164	299,169	231,277	335,689	359,275	277,743	107.4	138.0				
Fr. Morocco	22	22	15	100.0	149.9	5,543	4,176	3,080	6,667	5,015	3,698	132.8	180.0				
Tunis . . .	93	87	74	113.1	133.5	15,662	21,998	18,893	18,809	26,417	22,694	71.2	82.0				

s) Unmixed crop. — t) Mixed crop. — (1) Bearing crop. — (2) Must. — (3) Figure for four departments. — (4) Average 1926, 1928 and 1929.

Commercial stocks remain very high, scarcely inferior to those of last season, so that total supplies on 1 October 1931 were very considerable, between 1,540 (1,849) and 1,650 (1,981) million gallons. The French trade has still at its disposal 264 (317) to 286 (343) million gallons of Algerian wine and an annual contingent of over 66 (79) million of foreign and Tunisian wine. Supplies therefore are certainly greater than 1,780 (2,245) million gallons. It is known, however, that total French consumption has never exceeded 1,540 (1,849) million gallons, save in 1925-26, while it also approached this in 1929-30; during the last season it absorbed 1,320 (1,585) to 1,342 (1,611) million, a figure attained also in 1925-29; in 1927-28 and 1926-27 it was considerably less.

The 1931-32 season began quietly; supplies leaving growers' hands in October and November were very small; taxable consumption was maintained at a high level thanks

to commercial stocks being drawn upon. The large commercial stocks weigh on the market. Prices since July have experienced a considerable fall from an average of 175 francs per hectolitre for 9° red wine on the holding to 153 in August, then to 115 in September, while in October the average price of new wines was established at 91 francs, with a further decline of several points in November.

November was mild and rainy and work in the vineyards was largely stopped; cultivations were impossible and spreading of manure was also impracticable. Pruning was carried out in very unfavourable conditions.

Italy : In the following table are given the provisional data for 1931 of the production of grapes for various purposes, compared with those for 1930 and 1929

	1931	1930	1929
	—	—	—
		ooo pounds	
Total production of grapes . .	12,297,448	12,926,554	14,197,353
Wine grapes for wine-making . .	11,652,131	12,318,496	13,677,913
Wine grapes for consumption in the fresh state	437,588	396,728	314,590
Table grapes, fresh	187,149	182,568	170,797
Table grapes fresh, for drying	25,609	28,762	34,053
Grapes, dried	(8,569)	(9,672)	(11,681)

Cultivation of the soil for the newly planted vines was begun in the first half of November and continued during the remainder of the month

Argentina : The exceptionally intense frost of November 8 and the even more severe one of November 9 almost completely destroyed the grape crop in the province of Mendoza, which produces over 60 % of the total crop, and injured not only the fully opened flowers but also the woody growth of the previous two years almost to the base of the plant. According to the official data, the crop of whole regions was completely destroyed and for the whole of the province the loss is estimated at 85-90 %. In the other regions also and particularly those of Salta and San Juan, considerable losses were incurred varying from 20 to 25 % in San Juan and from 25 to 30 % in Salta. The Ministry of Agriculture has taken a series of appropriate measures to assist farmers, prescribing immediate and extensive pruning of plants to prevent their destruction and distributing gratuitously to the peasants 600 tons of seed potatoes and 500 of maize seed

United States : Quality of the grape crop on November 1 was estimated at 77.3 compared with 83.5 in November, 1930 and 89.3 on the average for the period 1920-1929.

Algeria : Crop declarations indicate a greater production than that previously given in the table. The figure, not yet officially published, is expected to be 336.6 million Imperial gallons (404.2 million American gallons), constituting a record. The total supplies of Algeria, including stocks should therefore at the beginning of the season have been about 374 million Imp. galls (449). During the past season the trade absorbed

from a crop of 299.2 million gallons (359.3), 275 million (330.2), of which 253.0 (303.8) were directed toward France. With a very poor crop and relatively high prices favouring imports, France absorbed 363.0 million Imperial gallons (435.9). With a crop of about 286 million gallons (343) greater than last year, abundant stocks and prices much below those prevailing last year on the metropolitan markets there are good grounds for believing that imports into France during the current season will not attain that exceptionally high figure. If account is taken of the commercial agreements with Spain, Italy and Greece, affecting 59.4 million Imperial gallons (71.3) and of the Tunisian contingent of 11.0 million gallons (13.2), it may be expected that the amount of foreign wine imported into France in the coming season will be scarcely inferior to 66 million gallons (79), unless the situation changes notably.

French Morocco. The vine situation is satisfactory. Pruning has just begun and in the coastal vineyards of Chaouia where it is already fairly well advanced.

Tripolitania. Excessively high summer temperatures somewhat reduced output

OLIVES

Although the official estimate of oil production in one of the most important producing countries, Italy, is not yet available, it may be calculated on the basis of the data at present known that world oil production in the season 1931-32 will amount approximately to about 18-18.7 million centals (232-246.2 million American gallons) or nearly double the production of 1930-31 (9.0 million centals 118.8, American gallons) and will about equal the average of the period 1927-28 to 1930-31 (18.5 million centals or 243.3 million American gallons), which, however, includes two years of record production, 1927-28 and 1929-30.

An examination of the situation in the individual producing countries leads to the following conclusions:

In Spain, although some damage was caused by drought and insects, oil production in the most important provinces was judged to be normal to good and the first estimate reaches 8.3 million centals (109.2 million American gallons). Trade activity, although favoured by depreciation of the national currency (at Madrid a dollar was worth 9.50 pesetas at the beginning of January and 11.15 on October 15, 1931), has been less in the present year than in 1930: exports in the first nine months of 1931 decreased by 93,000 centals (1,217,000 American gallons) of oil compared with the corresponding period of 1930 (1,662,000 centals or 21,843,000 American gallons against 1,755,000 centals or 23,060,000 American gallons). Prices, which continued to fall in the first half-year, rose rapidly in the third quarter: the monthly averages of prices in pesetas of the quality *Andaluz corriente Barcelona* being as follows: July 200; August 209 and September 219. The latest information indicates, however, that quotations now show a tendency to fall and that the market is quiet.

In Italy, despite the severe dropping of fruit during the summer, production is abundant; the first official estimate is 29.7 million centals of olives; assuming an average yield of 16% of oil (14.8 in 1927-28; 15.8 in 1928-29; 16.8 in 1929-30 and 16.1 in 1930-31), oil production may reach about 4 million centals or 58 million American gallons, this estimate is confirmed by a recent authoritative forecast which places Italian production at not much above the average of the last four years (average 1927-28 to 1930-31: 4,326,000 centals or 56,842,000 American gallons). Foreign trade has contracted considerably this

Olives and Olive Oil Production

COUNTRIES	AREA				ENGLISH MEASURES			AMERICAN MEASURES			% 1931/32	
	1931/32	1930/31	Average 1925/26 to 1929/30	% 1931/32	1931/32	1930/31	Average 1925/26 to 1929/30	1931/32	1930/31	Average 1925/26 to 1929/30	1930/1931 = 100	Aver. = 100
	Thousand acres				Thousand centals			Thous- (s) pounds and (t) American gallons			%	%
Spain (1) . . . .	...	4,651	4,206	.	(s) 43,480	13,655	43,446	1,347,904	1,305,493	1,344,563	318.4	89.7
Greece	—	—	—	—	(t) 8,309	2,534	9,152	109,187	33,298	120,273	327.9	90.8
Italy (a)	1,492	1,492	1,425	100.0	(t) 1,984	1,903	1,663	26,073	25,004	21,855	104.3	119.3
Portugal	4,131	4,133	4,201	99.9	(s) 29,655	17,196	27,658	2,965,472	1,719,567	2,765,771	172.5	107.2
—	—	—	—	—	(t) 1,504	—	4,801	35,667	56,515	—	—	—
Syria and Lebanon	188	187	170	100.5	(s) 1,695	973	1,244	160,536	97,334	124,352	174.2	136.3
Algeria	103	109	99	94.3	(t) 464	254	462	6,103	3,334	6,075	132.5	100.5
Tunis	—	—	—	—	(t) 1,320	400	830	17,400	5,200	11,600	330.0	150.0

a) Pure crop — b) Mixed crop. — s) Olives — t) Oil — (1) Area bearing — (2) Excluding the data for some districts.

year due partly to the smaller demand for inedible or sulphured olive oil by the United States. Prices during the first ten months of the current year have increased constantly and considerably; while the yearly average of producer's prices in 1930 was 501 liras per quintal, the monthly average rose in the period January-September 1931 from 550 to 600 liras, falling again to 591 in October. At the beginning of December the Italian oil market was on the whole quiet and prices on some markets showed a tendency to fall. As regards the other European countries producing olive oil, excellent production are anticipated in Greece and Portugal; in Greece all the largest producing provinces report good yields except Mytiline, where production is expected to be below the average; the production of Corfu was judged to be particularly good. In Portugal flowering was excellent and oil production is estimated to exceed the average of 1925-26 to 1929-30 by over 40 %. For France it is known that in the Maritime Alps area, despite some drought damage, production is expected to be good to normal; Corsican production is anticipated to be satisfactory.

In the French North African possessions, production of oil is judged to be excellent and by far larger than that of last season and the average of 1925-26 to 1929-30. Tunis and Algeria together, in fact, anticipate a production of 1,784,000 centals (23,503,000 American gallons). In the Italian colonies, on the contrary, weather conditions have been unfavourable to the crops and have caused some damage to the plants.

In the Eastern countries the situation varies; it is good in Syria and Lebanon, where flowering under favourable conditions has led to a heavy production of olives; good also in Palestine, where crop condition gives hope of good yields; not so good, however, in Turkey, an important producing country which anticipates a poor crop in the coastal area and a very poor one in the Aydin region.

In California the olive crop is estimated to be very poor, showing a decrease of 25-50 per cent. compared with that of last year.

Summarising the general situation, it may be presumed that the present oil season will give a world production of oil that, although smaller than the exceptional figures of 1928 and 1930 (23.4 million centals or 307.1 million American gallons and 27.1 million centals or 356.3 million American gallons respectively), will certainly be very

high ; this factor has already had its effects on the markets of the producing countries as prices, which increased in the period January-October, in general fell in November as a result principally of increased offering by producers desiring to realise.

M. C.

* * *

United States . Crop condition of olives on November 1 was 46 compared with 44 on October 1 and 58 on November 1, 1930

Palestine . Harvesting is in progress Yield is about 20 % below expectations.

Algeria The rains since September favoured enlargement of the fruit. Crop prospects are better and the harvest, which has everywhere begun, should be one of the best experienced It is especially abundant in the department of Algiers

Crop condition, which was 90 at the beginning of last month, was estimated at 100 on 1 December 1931, being considered average , on 1 December 1930 it was 50.

French Morocco . There is intense drought in southern Morocco Harvesting is in progress in all districts

Tripolitania : High summer temperatures had a bad effect on flowering ; small production has, however, been compensated for by very high quality.

Tunisia . November was relatively favourable to growth and especially to enlargement of the fruit Crop condition remains as last month, 120.

COTTON

U. S. S. R : On 1 December, according to Government instructions, 90 % of planned cotton acquisitions for the year should have been made. Actually, however, only 57.7 % had been made against 62 % last year.

The Central Asiatic republics had executed 55.9 % of the Plan, Transcaucasia 70.5 % and Kazakstan 68 %.

United States : In the week ended on November 25, late gathering of cotton was delayed by unfavourable weather in the northwestern portion of the belt and also in the Mississippi Valley districts with some damage to crops still out in the fields, elsewhere, gathering made good progress. In the following two weeks to December 9, cold, rain and snow further delayed harvesting.

The quantity of cotton not including linters, ginned from the 1931 crop, to close of business on 13 November, amounted to 14,210,000 running bales (counting round bales as half-bales) against 11,963,000 in 1930 and 11,890,000 in 1929 ; to close of business on 30 November 15,023,000 running bales, against 12,837,000 in 1930, 12,853,000 in 1929, 12,560,000 in 1928 and 11,738,000 in 1927 ; to close of business on 12 December 15,358,000 running bales, against 13,259,000 in 1930, 13,457,000 in 1929, 13,144,000 in 1928, 12,073,000 in 1927.

Guadeloupe : Drought has reduced the 1930-31 crop by one-quarter to one-third of the former estimates.

Cotton.

COUNTRIES	AREA					PRODUCTION								
	1931/32	1930/31	Aver.	% 1931/32	1931/32	1930/31	Aver.	1931/32	1930/31	Aver.	% 1931/32	1931/32	1930/31	
			1925/26	1930/31			1925/26			1930/31	1925/26			1930/31
			to				to				to			
			1929/30				1929/30				1929/30			
1,000 acres		= 100	= 100	1,000 centals		1,000 bales of 478 lbs.		= 100	= 100					
Bulgaria	18	18	11	97.0	120.4	23	18	15	5	4	3	130.8	161.1	
Italy	2	9	9	26.8	26.9	4	21	16	1	4	3	17.7	23.8	
*U. S. S. R. . .	5,825	3,870	1,974	150.5	295.1	...	7,403	5,030	...	1,549	1,052	...	...
United States . .	40,495	45,091	44,882	89.8	90.2	80,568	66,595	72,983	16,918	13,982	15,268	121.4	110.8	
Mexico	319	330	472	51.8	67.7	989	848	1,208	207	178	253	116.6	81.9	
China	5,238	5,693	4,474	92.0	117.1	8,839	11,742	9,100	1,840	2,456	1,904	75.3	97.1	
*Korea	461	463	495	90.6	93.0	...	726	658	...	152	138	...	...
India	22,358	23,014	24,377	97.1	91.7	16,384	20,032	21,548	3,428	4,191	4,508	81.8	76.0	
Syria & Lebanon	76	60	58	126.3	180.9	81	59	47	17	12	10	137.8	171.6	
Algeria	3	10	15	31.4	21.2	5	25	28	1	5	6	19.7	17.4	
Egypt	1,747	2,162	1,828	80.8	95.6	6,146	8,005	7,588	1,286	1,675	1,587	76.8	81.0	
Eritrea	7	7	7	107.1	111.1	11	8	8	2	2	2	140.8	140.4	
Uganda	876	739	615	118.6	142.4	880	744	620	184	156	130	118.7	142.2	
It. Somaliland .	10	19	16	51.8	60.6	17	17	20	4	3	4	103.7	84.4	
*Ang-Egypt Sud.	367	387	274	94.8	134.0	...	500	602	...	106	126	...	...
*Tanganyika . .	—	—	—	—	—	56	93	98	12	19	21	60.3	56.8	
Totals	71,144	77,201	16,764	92.2	92.7	114,247	108,114	113,181	23,902	22,618	23,678	105.7	100.9	

* Countries not included in the totals.

Mexico : The second estimate of cotton production, which is 2.06% below that published in the October Report, is now known. During October and the first half of November, ginning continued and yields vary from fairly good to good. The work of preparing the fields for the sowings has already begun under good conditions.

India : In Bombay Presidency the weather in November was mostly dry apart from local rainfall. In the Central Provinces variable light to heavy rains in the first half of November somewhat damaged cotton; in the remainder of the month, weather was clear and cool. In Madras Presidency rainfall was moderate to heavy in the first half of November and light to moderate locally in the latter half; condition on November 28 was fair. According to a telegram of December 9 from the Madras Government the area under cotton for the season 1931-32 is 1,778,000 acres compared with 1,779,600 in 1930-31 and 1,947,800 on the average for the preceding five seasons; percentages: 99.9 and 91.3 respectively; corresponding figures of production are: 1931-32; 1,368,000 centals (286,200 bales); 1930-31: 1,416,000 (296,300); average: 1,550,000 (324,300); percentages: 96.6 and 88.3. November weather in the Punjab was dry. During the month bollworm damaged American cotton in Shahpur, and both American and Deshi in Lyallpur and Multan. Cotton in parts of Ambala was damaged by rats and in parts of Dera Ghazi Khan by insects; condition at the end of the month was below average to average. According to a telegram of December 8 from the Punjab Government, the cotton area for 1931-32 is estimated at 2,545,000 acres or 4.7 % larger than the corresponding estimate of 1930-31 (2,431,000) and 2.1 % below the average (2,599,000). Production, however, is estimated at 2,000,000 centals (418,400 bales) or 27.6 % below the corresponding forecast for 1930-31 of 2,764,000 (578,200) and 25.2 % below the average of 2,673,000 (559,000) for the five season 1925-26 to 1929-30.

Syria and Lebanon : Weather was unfavourable to the bolls of the late crop in the Alawiyya State (government of Latakia). In Syria, on the other hand, conditions were favourable.

French West Africa : In Dahomey, the cotton crop was small this year, due partly to low prices and slack trade. Planters in some areas have picked only the first crop and abandoned the second and third; in others, the abrupt termination of the rains brought about a reduction of production. Lastly, the proportion of the crop which has been marketed is relatively low, being one-tenth in the Batam district, where the quantity marketed is hardly a quarter of the normal.

The 1930-31 crop in the French Sudan amounted to about 200,000 centals (42,000 bales) of unginned cotton, that is, about 45,000 (9,500) of lint, compared with 2,700 (565) last year.

Algeria : The harvest was completed under rather unfavourable conditions, the rains of the latter half of November having been an obstacle to picking. Parasites also considerably reduced the crop.

Egypt : At the beginning of November picking had already ended and toward the end of the month no more cotton remained in the fields. Yields are almost the same for Sakellaridis as last year, for other varieties they are inferior by 10 to 20 %. Ginning yields appear to be 2-3 % below those of last year.

Cotton ginned from 1 September to 30 November in centals and bales of 478 lbs net weight was as follows:

		1931	1930	1929	1928
Sakellaridis	Centals	580,940	781,100	1,081,140	1,328,550
	Bales	121,540	163,410	226,180	277,940
Other varieties	Centals	2,685,810	2,814,370	2,977,860	3,245,950
	Bales	561,880	588,780	622,980	679,070
<i>Total lint</i> ,	Centals	3,266,750	3,595,470	4,059,000	4,574,500
	Bales	683,420	752,190	849,160	957,010
Scarto (linters)	Centals	81,720	79,100	88,140	120,350
	Bales	17,100	16,550	18,440	25,180

The corresponding figures as on 31 October 1931 were respectively as follows: 218,130 centals (45,630 bales); 1,623,810 (339,710); 1,841,940 (385,340); 41,480 (8,680).

Uganda : The new production estimate published in the general table, shows a considerable reduction on the preceding one, due to exexceptional rains in certain districts and to insect damage. This estimate, based on conditions at the end of October, is, of course, subject to considerable modifications with change in crop condition

FLAX

With the first official estimate of the Argentine crop just published, the data so far available of linseed production in the current year cover a group of countries that on the average furnishes about 90 % of world production excluding that of the U. S. S. R.

Linseed.

COUNTRIES	AREA					PRODUCTION									
	1931	1930	Aveg. 1925 to 1929	% 1931 1931/32	1931	1931	1930	Average 1925 to 1929	1931	1930	Average 1925 to 1929	% 1931 1931/32	1931	1930	Average 1925 to 1929
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	1921/32	1930/31	1925/26 to 1929/30	1930 — Aver.	1931 — Aver.	1931/32	1930/31	1925/26 to 1929/30	1931/32	1930/31	1925/26 to 1929/30	1930 — Aver.	1931 — Aver.	1930/31	1931 — Aver.
	1,000 acres					1,000 centals			1,000 bush. of 56 pounds						
*Germany . .	16	27	49	59.8	33.4	(1) 73	—	—	(1) 130	—	—	—	—	—	—
Austria . .	5	5	8	90.9	59.8	18	10	27	32	34	49	94.1	65.8	—	—
Belgium . .	36	56	59	63.6	60.5	127	233	287	227	417	512	54.4	44.3	—	—
Bulgaria . .	2	1	1	238.9	290.2	11	3	2	19	5	3	408.4	594.7	—	—
Estonia . .	45	80	89	56.3	50.8	141	279	222	251	499	396	50.4	63.4	—	—
Italy . .	21	24	44	83.5	48.0	113	125	206	202	224	368	90.4	54.9	—	—
Latvia (2) . .	104	128	163	81.1	63.7	326	410	452	532	733	808	79.4	72.0	—	—
Lithuan (2) . .	139	204	211	67.8	65.6	620	853	824	1,107	1,532	1,471	72.3	75.3	—	—
Poland . .	252	285	280	85.4	90.2	1,102	1,308	1,467	1,968	2,335	2,620	84.3	75.1	—	—
Czechoslov . .	23	31	52	72.7	44.1	72	94	202	128	169	361	75.7	35.8	—	—
*U.S.S.R. . .	7,735	5,553	4,267	139.3	181.3	...	...	13,255	...	...	23,670	...	...	...	...
Canada . .	623	582	563	107.9	111.5	1,594	2,463	2,553	2,347	4,399	4,558	64.7	62.5	—	—
United States	2,313	3,732	2,909	62.0	70.5	6,170	11,894	11,713	11,018	21,240	20,917	51.9	52.7	—	—
India . .	3,020	2,302	3,392	107.8	89.0	8,467	8,512	8,848	15,120	15,200	15,800	99.5	95.7	—	—
*Eritrea . .	2	—	10	—	31.2	9	—	38	16	—	68	—	23.1	—	—
French Mor . .	67	58	48	118.1	140.3	411	251	229	734	448	408	164.0	179.9	—	—
Argentina . .	(3) 8,640	(3) 7,511	(3) 6,916	115.0	124.9	46,297	39,348	41,099	82,674	70,263	73,391	117.7	112.6	—	—
*Uruguay . .	606	402	204	150.7	297.2	...	2,575	1,254	...	4,59 ⁵	2,240	...	...	—	—
Grand Total	15,295	15,499	14,735	98.6	103.8	65,469	65,797	68,131	116,909	117,500	121,662	99.5	96.1	—	—

* Countries not included in the total. — (1) Private estimate. — (2) Flax and hemp — (3) Area sown.

On the basis of these estimates and taking into account approximate estimates of the probable production of Poland, France, Hungary and a few other producing countries of minor importance, it may be calculated that world production of linseed (excluding the U. S. S. R., for which no reliable figures are possessed) should this year amount to 71-73 million centals (126-130 million bushels), a quantity slightly larger than that of last year, estimated at 69.9 million centals (124.8 million bushels) and still larger in comparison with the average for the five-year period 1925-29 (69.2 million centals or 123.6 million bushels). This year's good crop is due principally to the abundant production in Argentina, which is partly the result of the larger acreage sown and to a greater extent of the persistently favourable weather conditions for the crop since sowing time; the crop is consequently forecast at 46 million centals (83 million bushels), equalling the maximum production obtained in Argentina in 1927-28. In Uruguay there are also prospects of a fairly good crop. The official estimate is not yet available but the large increase in the area sown and the favourable course of the season lead to the forecast of a production much larger than that of last year. In recent years the crop has made enormous progress in Uruguay, the area sown this year being 50 % larger than that of last season and three times larger than the average of the last five years. This is largely due to active Government propaganda for the extension of the linseed crop and to favourable climatic and soil conditions assuring high yields, which average about 6 centals (11 bushels) per acre. At present Uruguay occupies third place among the large exporters of linseed, following Argentina and India.

With regard to India, production in 1931 has been practically normal, being nearly equal to that of last year and only a little below the average of 1925-29.

In Europe, linseed production, which shows a tendency to decline, has not had an altogether favourable year. Almost all countries reduced acreage sown and unfavourable weather lowered yield per acre, production is smaller than last year and well below the average.

In North America the season was unfavourable in both Canada and the United States, crops were severely damaged by intense summer drought. Although the area sown in the two countries is this year slightly smaller than last year (but about 10 % above the average of the preceding five years) the crop was exceptionally poor and 40 % smaller than that of last year and the average of the preceding five years.

For the U. S. S. R. no estimate of the crop is so far to hand. The area sown to flax was considerably increased compared with both that of last year and the five-year average but the weather was apparently rather unfavourable to the crop, which, like the other spring crops, suffered from the summer drought. The production of the U. S. S. R. is, moreover, absorbed entirely by home consumption and only insignificant quantities are exported.

As regards world supplies, the abundant production of Argentina places at the disposal of importing countries during the season 1932 large quantities, which, taking into account the quantities needed for seed and for home consumption, may be estimated at about 42 million centals (75 million bushels).

Linseed.

YEAR	Production of Argentina		Exports from Argentina		Net imports into Europe and North America	
	million centals	bushels	million centals	bushels	million centals	bushels
1925	25.4	45.3	21.2	37.8	32.4	57.9
1926	42.1	75.2	36.8	65.7	43.0	76.8
1927	45.2	80.7	41.7	74.4	45.6	81.5
1928	46.3	82.7	42.8	76.4	47.2	84.2
1929	43.9	78.3	35.7	63.8	45.6	81.5
1930	28.0	50.0	25.6	45.7	31.7	56.7
1931	39.2	70.1	(1) 36.8	(1) 65.7	(2) 39.9	(2) 71.3
1932	46.3	82.7	...	...	...	...

It is, however, doubtful whether these supplies can be absorbed, despite the poor crops obtained in Europe and North America, due to the slackening of trade and reduced demand for consumption, especially as in India forecasts of the crop on an increased acreage, are good.

Prices, which have for some time shown a marked tendency to fall, have weakened

(1) Exports up to 29 October. — (2) Net imports up to 31 October.

Prices of linseed, Plate, at Hull

(Prices, c i f, on board for the current or following month in pounds sterling per long ton).

		£ - s - d
Yearly average	1913	11-11-5
»	» 1930	15-1-7
Monthly average	January, 1931	8-6-9
»	» February	9-1-3
»	» March	9-6-3
»	» April	8-16-10
»	» May	8-8-6
»	» June	8-7-6
»	» July	8-16-6
»	» August	8-2-6
»	» September (1)	7-11-3
»	» October (2)	6-16-4
»	» November (2)	6-10-9

further during recent months, the average quotations for November were nearly $\frac{2}{3}$ below those of 1930 and 40 % below the pre-war level.

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* * *

Great Britain and Northern Ireland This season's crop is of fairly good quality; the yield is moderate.

Argentina. (Telegram of 18 December). The harvest has given satisfactory results. Hail and caterpillars have caused slight damage. The average yield per acre is estimated at 5 4 centals (9.6 bushels)

United States: The quality of the linseed crop on November 1 was estimated at 81.3 against 84.6 in November last year and 89.1, the average of 1920-29. The low quality this year is due chiefly to severe heat damage in the Dakotas and Montana.

India: Crop condition of flax in Bihar and Orissa at the end of November was good. In the Central Provinces variable light to heavy rains fall in the first half of November but in the remainder of the month the weather was clear and cool. In the United Provinces practically no rain fell during November

(1) Average for the first three weeks. — (2) To ensure comparability with the preceding quotations account has been taken of the percentage depreciation of the pound sterling in October and November.

Flax (Fibre).

COUNTRIES	AREA				PRODUCTION								
	1931	1930	Average 1925 to 1929		% 1931	1931	1930	Average 1925 to 1929		% 1931			
			1930	Average = 100				1930	Average 1925 to 1929				
											1930	Average = 100	
1,000 acres				1,000 centals			1,000 pounds						
Germany . . .	16	27	49	59.8	33.4	(1) 117	—	152	11,684	—	—	—	—
Austria †) . .	8	8	(2) 11	90.3	70.2	109	127	(2) 152	10,935	12,694	(2) 15,225	86.1	71.8
Belgium . . .	36	56	59	63.6	60.5	192	325	580	19,156	32,499	57,950	58.9	33.1
Bulgaria . . .	2	1	1	232.9	299.2	2	2	1	176	239	147	78.6	119.8
Estonia . . .	45	80	89	56.3	50.8	130	237	221	13,008	23,745	22,084	54.8	58.9
Finland (3) . .	10	14	12	72.7	81.9	...	35	31	...	3,527	3,098	...	...
Northern Irel.	7	29	33	26.1	22.1	...	120	132	...	12,032	13,761	...	...
Hungary †) . .	44	36	7	123.0	—	...	869	—	...	86,913	—	...	...
Italy	12	13	18	96.5	69.6	50	56	56	5,000	5,573	5,639	89.7	88.7
Latvia (3) . .	104	128	163	81.1	63.7	331	424	487	33,056	42,395	43,714	78.0	67.9
Lithuania (3) .	137	204	211	67.8	65.6	518	642	802	51,765	64,188	80,199	80.6	64.5
Netherlands . .	16	37	37	43.2	43.2	82	230	253	8,234	22,957	25,346	35.9	32.5
Poland	232	255	280	83.4	90.2	661	973	1,243	66,139	97,300	124,345	68.0	53.2
Rumania . . .	69	44	50	157.5	135.9	...	59	55	...	5,933	5,511	...	...
Czechoslov. . .	23	31	52	72.7	44.1	83	128	238	8,344	12,816	23,764	65.1	35.1
U. S. S. R. (4)	5,733	4,278	3,271	134.0	175.3	...	9,449	7,064	...	944,904	706,425	...	...

†) Production expressed in dried flax straw. — (1) Private estimate. — (2) Average 1927 to 1929. — (3) Flax and hemp. — (4) Dolgunetz quality.

HEMP

COUNTRIES	AREA					PRODUCTION				
	1931	1930	Average 1925 to 1929	% 1931		1931	1930	Average 1925 to 1929	% 1931	
				1930 = 100	Aver- age = 100				1930 = 100	Aver- age = 100
1,000 acres				1,000 pounds						
<i>Fibre.</i>										
Germany (1)	1	1	4	80.4	19.5	—	—	—	—	—
Austria	1	1	(2) 1	80.4	89.9	(3) 1,301	(3) 1,789	(3) 1,770	72.7	73.5
Bulgaria	9	9	10	102.6	94.8	4,189	3,299	3,028	127.0	138.3
Italy	160	214	236	74.8	67.9	125,959	201,400	222,033	62.5	56.7
Poland	76	79	74	97.0	102.8	22,046	46,103	42,655	47.8	51.7
Rumania	120	83	101	145.3	118.9	...	37,323	36,741	...	...
Czechoslovakia . . .	21	15	26	134.0	78.7	10,888	8,959	16,436	121.5	66.2
U. S. S. R.	2,277	1,854	2,268	122.8	100.4	...	...	695,913	...	...
<hr/>										
Syria and Lebanon	6	6	6	96.4	94.5	2,954	3,576	3,761	82.6	78.6

*Fibre.**Hempseed.*

Austria	(4) 9	(4) 9	1	82.9	61.5	154	198	266	78.0	58.1	—	—
Bulgaria	9	9	10	102.6	94.8	3,668	2,324	2,525	157.9	145.3	—	—
Italy	160	214	236	74.8	67.9	7,542	10,875	13,563	69.3	55.6	—	—
Poland	76	79	74	97.0	102.8	44,093	48,340	44,176	91.2	99.8	—	—
Czechoslovakia . .	21	15	26	134.0	78.7	8,020	6,340	11,776	126.5	68.1	—	—
U. S. S. R.	2,277	1,854	2,268	122.8	100.4	...	...	1,229,963	...	...	—	—

(1) Hemp and other textile plants. — (2) Average 1927 to 1929. — (3) Dried fibre. — (4) Area under 500 acres

OTHER PRODUCTS

Tea.

Ceylon . Weather in November was prevalently wet in the centre and south-west. Crop condition at the beginning of the month was average.

India . In North India weather conditions were generally seasonable throughout October although wet and cold towards the latter part of the month. Crop prospects were fair. Production to the end of October recorded a decrease of about 2 million lb. as compared with the same period last year.

In South India the weather during October was generally favourable and prospects were good. The outturn was 4 20 % ahead of that to the same date of last year.

Coffee.

Guadeloupe : Despite the drought the crop is above expectations. Exports are more than double those of 1930.

Haiti . Weather conditions have been very favourable to the coffee crop, the condition of which is good. A heavy crop is anticipated. The Government has organised an active propaganda campaign to improve methods of cultivation, which are still very backward.

Mexico : During October harvesting began in the principal producing States and gave yields above those of last year ; they were not, however, very satisfactory.

French West Africa : A recent census in Dahomey indicates that for this colony the area of coffee plantations is 1,725 acres and there are in addition 52,340 scattered bushes. No other recent estimate of the crop has been made.

Cacao.

French West Africa : A recent census in Dahomey indicates that for this colony they are 300 acres of plantations and in addition 17,575 scattered bushes. The first estimates of these plantations made in 1929 gave the figure of 450 acres but probably the two figures for 1931 and 1929 are not comparable.

Gold Coast : Weather conditions in most districts in November were more favourable than in the preceding month and ripening and harvesting proceeded normally. In Ashanti ripening was especially rapid and 75 % of the crop in the province had been harvested by the end of November, with quality above average. In the Eastern Province at the same date 60 % had been harvested. In the Central Province weather in the north has not been so good and diseased pods are numerous, yields consequently not being as high as anticipated in October ; 53 % had been harvested, rain having caused delay ; it was expected that all the crop would be ripe by the end of December. In the Western

Province 40 % of the crop had been harvested. Taking the country as a whole, the second picking was good but the next was expected to be smaller. The estimate for the total major crop remained unchanged at the end of November, namely 414.4 million lb.

Crop movement was comparatively rapid in Ashanti, compared with that in other provinces and at the same time last year, 55 % having been marketed by the end of November. In the Eastern Province the rise in prices in the earlier part of the month stimulated fairly quick marketing and 45 % had been marketed by the end of the month. In the Central Province movement was steady and 38 % had been marketed while in the Western Province the corresponding figure was 20 %. On the whole movement was fairly free though prices in the districts were fluctuating.

Crop movement has been as follows :

	November 1931	October 1931	October- November 1931	October- November 1930
Arrivals by rail at Takoradi and Accra (1000 lb.)	55,664	11,652	67,316	41,220
Shipments from Takoradi and Accra (1000 lb.)	35,840	11,540	47,380	—
Shipments from all ports (1000 lb.)	42,224	12,540	54,764	58,200
Stocks at end of month, Takoradi and Accra beach (1000 lb.)	30,800	7,307	—	—

It should be noted that the above statistics of arrivals at ports take no account of arrivals by road, which in the case of Accra make up about 50 % of the total despatched to that port from the Eastern Province, from which come all its shipments save about 2000 tons from British Togoland.

Colza, Mustard and Sesamum.

Austria : Crop condition of winter colza on 1 December was 2.5 against 2.6 on 1 November of this year and 2.4 on 1 December 1930.

Poland : Area this year is 106,300 acres, an increase of 63.3 % on that of last year (65,100 acres) and an increase of 72.1 % on the average of the five years ending 1929 (61,700 acres).

Production of colza in the present year amounted to 882,000 centals (1,764,000 bushels) against 610,000 (1,219,000) in 1930 and 542,000 (1,084,000), the average of the period 1925-1929. Percentages 144.7 and 162.7.

Rumania : According to provisional incomplete data up to 7 November the area sown to winter colza was 64,000 acres against 59,000 at the same date in 1930.

Mexico : During October the sesamum crop began in the principal producing States and has given good results. In the areas of less importance yields are fairly good.

India : In Bihar and Orissa crop condition at the end of November was good. Rain caused some damage to crops in Bengal in the first half of November but in the latter half the weather was dry. Weather was dry throughout November in the Punjab and at the end of the month condition was average to good.

Syria and Lebanon : Area of sesamum this year is 11,000 acres, an increase of 11,0 on that of last year (9,900 acres) and a decrease of 44.5 % on the average of the five years ending 1929 (19,800 acres)

Production this year is 41,000 centals (2,050 short tons) an increase of 41 % on that of last year (39,400 centals, 2,000 short tons) and a decrease of 53.7 % on the average of the five years ending 1929 (88,600 centals, or 4,400 short tons)

Groundnuts.

United States Area of groundnuts 1931. 2,172,000 acres; 1930: 1,862,000, average 1925-29; 1,723,000, percentages respectively 116.6 and 126.1. Production. 1931. 1,554,410,000 lbs; 1930 1,176,700,000, average 1,173,742,000, 132.1 % and 132.4. % .

French West Africa . In Senegal the condition of groundnuts was good. Despite the delay caused by insufficient rain, the sowings have been effected under good conditions. There seems to be no lack of seed, the agricultural societies have made considerable efforts and have distributed about 397,000 centals of seed against 309,000 last year. Thanks to the large number of drills available 8,600 acres have been sown

In Dahomey the area sown to groundnuts seems to be larger than that of last year. Disease (" rosette ") has appeared in two districts.

In the Sudan, the acreages sown also seem larger than last year.

Egypt . Weather in November favoured ripening. The harvest is proceeding. Yields are effected to be 10 % below average. Crop condition on 1 December was 89 against 100 on 1 November last and 1 December 1930

Tobacco.

United States . Quality of the tobacco crop this year is estimated at 75.8 compared with 73.3 in November last year and 79.0 on the average for 1920-1929. Although qual-

Tobacco.

COUNTRIES	AREA					PRODUCTION				
	1931	1930	Average 1925 to 1929	% 1931		1931	1930	Average 1925 to 1929	% 1931	
				1930	Aver.				1930	Aver.
	1,000 acres			= 100	= 100	1,000 pounds			= 100	= 100
*Germany.	26	23	21	112.1	119.8	...	46,409	44,112	...	...
Belgium.	7	7	7	100.0	97.2	12,739	15,387	15,334	82.8	83.1
Bulgaria.	77	79	83	96.7	92.7	54,784	59,395	60,580	92.2	90.4
*Greece. . . . .	...	195	221	...	...	98,767	152,660	137,965	64.7	71.6
*Rumania.	40	85	77	40.8	51.6	...	53,012	42,445	...	...
Czechoslovakia. . .	22	18	14	125.7	157.4	27,778	22,095	16,942	125.7	170.0
*U. S. S. R.	406	248	210	164.0	193.6	—	—	—	—	—
*Canada. . . . .	...	41	37	...	...	48,230	36,717	34,774	131.4	138.7
United States. . .	2,020	2,101	1,787	96.1	113.0	1,610,098	1,635,210	1,357,127	98.5	118.6
Japan.	91	89	91	102.7	100.8	155,757	145,175	142,157	107.3	109.6
Syria and Lebanon. .	21	10	7	207.9	278.4	12,092	6,960	4,959	173.7	243.8
Algeria.	40	57	65	68.9	60.6	20,233	43,486	54,238	46.6	37.4
*Tripolitania. . . .	1	1	—	88.2	—	1,323	1,543 (1)	248	85.7	545.0
Totals. . .	2,278	2,361	2,054	96.4	116.8	1,893,531	1,937,798	1,656,732	98.2	114.7

* Countries not included in the totals. — (1) Average 1927 and 1928.

ity is somewhat below average, the warm, dry weather in October was unusually favourable for the proper curing of the crop and in general good colours have been obtained. Quality of flue cured is 64 against 70 last year, burley 84 against 73, dark air-cured 83 against 78 and that of fire cured is above the average.

Algeria The crop is of good quality but yields are extremely low

Hops.

COUNTRIES	AREA					PRODUCTION				
	1931	1930	Average 1925 to 1929	% 1931		1931	1930	Average 1925 to 1929	% 1931	
				1930 = 100	Average = 100				1930 = 100	Average = 100
1,000 acres					1,000 pounds					
*Germany	25	32	36	79.6	70.5	...	24,366	16,111	...	...
Belgium	3	3	3	100.0	73.9	2,271	2,961	5,118	76.7	44.4
England and Wales.	20	20	25	97.7	79.6	18,923	28,336	34,563	68.8	54.8
Czechoslovakia . .	30	38	36	79.6	85.2	24,725	32,464	21,520	76.2	114.9
*U. S. S. R.	3	—	(1)	11	—	29.1	1,761	—	—	—
United States . . .	21	19	23	109.7	91.6	25,852	23,447	31,383	110.3	82.4
Totals. . .	74	80	87	93.7	88.2	71,776	87,266	92,584	82.3	77.4

* Countries not included in the totals. — (1) Year 1927.

Sericulture.

COUNTRIES	QUANTITIES OF EGGS PREPARED FOR INCUBATION					PRODUCTION OF COCOONS				
	1931	1930	Average 1925 to 1929	% 1931		1931	1930	Average 1925 to 1929	% 1931	
				1930 = 100	Aver. = 100				1930 = 100	Aver. = 100
1,000 ounces					1,000 pounds					
Bulgaria	20	44	40	45.8	50.4	2,646	4,995	4,388	53.0	60.3
Italy	701	946	993	74.1	70.6	75,968	116,250	109,297	65.3	69.5
Korea. s)	222	225	185	98.6	120.2	27,605	28,404	19,953	97.2	138.4
Japon {s)	2,807	2,790	2,560	100.6	109.6	435,419	463,825	356,033	93.9	112.8
{t)	2,935	3,339	3,537	87.9	83.0	332,562	416,356	371,804	79.9	89.4
Syria and Lebanon.	81	106	96	76.7	84.6	6,206	8,047	6,844	77.1	90.7
Total . . .	6,766	7,450	7,411	90.8	91.3	880,496	1,637,886	898,319	84.8	98.0

s) Spring cocoons. — f) Summer-autumn cocoons.

FODDER CROPS

Austria: On 1 December crop condition was as follows: red clover 2.6 (against 2.8 on 1 November 1931 and 2.4 on 1 December 1930); luzerne: 2.8 (2.6; 3.0), mixed clover: 2.5 (2.7; 2.4); mixed fodder and vetches: 2.8 (2.8; 2.6); permanent pasture: 2.6 (2.8, 2.5) and pastures: 3.1 (3.2; 2.7).

Belgium : Fine, sunny weather in November, alternating with some days of rain, favoured the pulling and transport of fodder roots. Mangolds have continued to grow well and the mild weather has permitted a good utilisation of the crop. Conditions for the growth of meadows and clover fields are excellent. Field work has been effected regularly and was very well advanced at the end of December.

Irish Free State . Mangels yielded below average but the roots are sound. Turnips were still growing in November and were expected to yield close to the average

France . November favoured vegetation and pastures are rich

Great Britain and Northern Ireland : The mild and rather wet weather has been favourable to grass and root crops. In England and Wales turnips are reported as a moderate crop, the roots being below average in size ; in Scotland lifting was postponed where possible to allow continued growth. Swedes were still being lifted in November in England and Wales and, though below average in size, are of fair quality. Lifting of mangolds was practically completed during the month under fairly good conditions in England and Wales ; reports vary as to quality but the roots are on the small side, the crop is generally described as sound and better than earlier expectations.

The following are the data of production in Scotland .

		1931	1930	Av. 1925-29	$\frac{1930}{100}$	$\frac{1931}{Av. 1930}$
Turnips and swedes	(million centals)	121.8	130.4	147.4		
	(thousand sh. tons)	6,091	6,521	7,372	93	83
Mangels	(million centals)	44	55	50		
	(thousand sh. tons)	22.0	27.4	24.8	80	89
Temporary meadows	(million centals)	16.3	14.6	14.9		
	(thousand sh. tons)	815	729	744	112	110
Permanent meadows	(million centals)	5.9	6.0	5.9		
	(thousand sh. tons)	297	301	295	99	101

The data of production in England and Wales have been revised and are as follows .

England and Wales.

Turnips and swedes	(million centals)	156.3	177.6	210.9		
	(thousand sh. tons)	7,816	8,879	10,543	88	74
Mangels	(million centals)	101.3	121.9	139.5		
	(thousand sh. tons)	5,066	6,094	6,975	83	73
Temporary meadows	(million centals)	58.4	52.0	48.9		
	(thousand sh. tons)	2,918	2,600	2,444	112	119
Permanent meadows	(million centals)	119.3	125.1	95.6		
	(thousand sh. tons)	5,967	6,257	4,780	95	125

Italy : In the first half of November, the last cutting of meadows continued ; autumn grass is growing well. In the last two weeks the meadows and pastures, favoured by rains and mild temperature, have recovered in growth.

Lithuania . Weather in November was not very favourable to crops, especially at the end of the month, when frosts commenced.

Netherlands . Though the quantity of fodder for indoor feeding is abundant the prices of milk and milk products are too low to encourage intensive feeding.

Argentina : Pastures are in good condition and fodder shortage exists only to some extent in the Pampa. In the provinces of Cordoba and Santa Fé many fields sown to rye, barley and oats have been grazed.

Canada . Owing to an error in the telegraphic transmission of data from Canada, the figures given in the November Crop Report for production of turnips, fodder maize and hay and clover were incorrect. The correct figures are given below

Production (in thousand)

		1931	1930	Average 1925-1929	1930 = 100	% Av. = 100
Turnips, etc	(centals)	41,292	41,064	37,520	100.6	110.1
	(sh. tons)	2,065	2,053	1,876		
Fodder maize	(centals)	68,892	69,514	78,871	99.1	87.3
	(sh. tons)	3,445	3,476	3,944		
Hay and clover	(centals)	291,800	327,940	314,953	89.0	92.6
	(sh. tons)	14,590	16,397	15,748		

United States : On about November 25 pastures and grass were largely good in central valley sections but in more eastern States, particularly from New York southward to Florida, moisture conditions were very unsatisfactory, with soaking rains needed.

Acreage and production of certain clover and grass seeds in 1931 are given in the following table together with the final figures for last year and the average

	1931	(1) 1930	Average 1925/29	1930 = 100	% 1931 Av. = 100
<i>Area (in thousand acres)</i>					
Clover seed (red and alsike)	861	1,037	962	83.0	89.5
Timothy seed	423	395	535	107.1	79.1
Alfalfa seed	324	409	269	79.2	120.4
Sweet clover seed	185	172	251	107.6	73.7

(1) Acreage and production in 1930 revised on the basis of the 1930 Census.

		1931	(1) 1930	Average 1925/29	% 1931 1930 = 100	Av. = 100
		—	—	—	—	—
<i>Production (thousands)</i>						
Clover seed (red and Alsike) .(centals) . .		834	966	840	86.3	99.3
	(bushels) .	1,390	1,610	1,400		
Timothy seed . . .	(centals) . . .	765	783	913	97.7	83.7
	(bushels) .	1,700	1,740	2,030		
Alfalfa seed . . .	(centals) . . .	498	696	510		
	(bushels) .	830	1,160	850	71.6	97.6
Sweet clover seed . . .	(centals) . . .	390	414	624		
	(bushels) . . .	650	690	1,040	94.2	62.5

Production of the clover and grass seeds mentioned above is smaller than in 1930, that of alfalfa seed, for example being 28.4 % less, and is also below the average especially of sweet clover seed. Production of timothy and sweet clover seeds was smaller than in 1930 although the acreages sown to these crops were over 7 % larger than in that year. In interpreting these results, however, it must be remembered that the figures for 1930 have been revised on the basis of the 1930 census.

Unfavourable weather has greatly reduced the production of hay in the United States this year, as may be observed from the following figures :

		1931	1930	Average 1925-1929	% 1931 1930 = 100	Av. = 100
		—	—	—	—	—
<i>Area (in thousand acres).</i>						
Tame hay		53,449	54,080	59,172	98.8	90.3
Wild hay		11,977	13,810	13,872	86.7	86.3
<i>Production (in thousands)</i>						
Tame hay (centals)		1,284,660	1,557,000	1,887,280		
	(sh. tons)	64,233	77,850	94,364	82.5	68.1
Wild hay (centals)		162,660	236,500	261,193		
	(sh. tons)	8,133	11,825	13,059	68.8	62.3

Palestine : Germination of bersim is good.

Algeria : The condition of pastures is good in the centre and West. In the East, on the contrary, in the Department of Constantine, the situation is bad ; it is feared that the grass will not have time to grow sufficiently before the winter cold sets in.

(1) Acreage and production in 1930 revised on the basis of the 1930 Census.

Egypt : Weather in November favoured sowings, germination and growth of ber-sim. Sowings were almost ended. First cutting was already begun in all districts. Crop condition on 1 December was 100 as on 1 November 1931 and 1 December 1930.

French Morocco : Rather general alternation of rain and fine weather have permitted a good recovery of pasture grass.

LIVESTOCK AND DERIVATIVES

Condition of livestock and dairy production.

Belgium : The condition of livestock is good. Production of fodder crop is abundant and permits economical feeding.

Irish Free State : Hay is abundant though grain supplies are below average. Combined supplies are considered adequate to meet winter needs. Milk yields suffered the usual seasonal decline.

France : The situation is good. During the autumn there was a considerable fall in the prices for larger stock, reaching 40-50 % for some categories in certain regions.

Great Britain and Northern Ireland : Cattle are generally in fair condition; the mild weather in November enabled them to be kept out later than usual. In England and Wales there was, for the time of year, a good bite in the pastures but in Northern Ireland pastures failed considerably owing to the adverse weather. In the latter area condition of store cattle was well-maintained, particularly where a little hand feeding was practiced. In England and Wales and in some parts of Scotland milk yields were below the usual for November owing, it is said, to the poor quality of this season's hay and to the reluctance of farmers to feed concentrates. In some areas folded sheep suffered from the wet and fluke was reported from some districts in both England and Wales and Northern Ireland. Fodder supplies are generally sufficient but both in Scotland and in Northern Ireland it is expected that the supply of turnips would be short of requirements later in the season. From Scotland it is reported that ample supplies of concentrated feeding stuffs are available at fairly steady prices excepting milling offals, bran being scarce and dear.

Hungary : According to the official report of 12 December available supplies of fodder should suffice for the winter if they are distributed economically. Health of stock is generally satisfactory; only in isolated cases are losses of young pigs reported.

Argentina : The Director of Livestock Production has recommended producers to alter the destination of the milk produced at this period of the year and which has been finding existing outlets difficult. This will lighten the burden of stocks that has been depressing the market and remove inferior qualities. The Director has also recommended that the skimming of the milk and its transformation into butter should be carried out very carefully so as not to affect the quality of the cheese.

Health of livestock is everywhere good. Reproduction of cattle has been normal; that of sheep has already ended with good results. The first clip gave good yields. Working cattle are in excellent condition. Fodder supplies are abundant; only on the Pampa are pastures less satisfactory, but the general condition of stock is very good.

Chile In the following table are given the data of production of milk and its derivatives in 1930 compared with those for 1925 and 1924.

Product		1930	1925	1924
			(thousands)	
Milk	(Imperial gallons)	60,447	36,342	38,518
	(American gallons)	72,592	43,643	46,257
Cheese	(lbs)	5,518	5,694	6,312
Butter	(lbs)	7,727	2,787	2,945

The largest relative increase noted is that for butter, production of which was nearly trebled compared with 1925 and 1924. The increased milk production is largely the result of the increased number of cows but also of improvements in the breeds kept. There is a decrease in 1930 only for cheese.

Production of greasy wool in 1930 amounted to 26,677,000 lbs against 25,236,000 in 1925 and 24,796,000 in 1924

United States : With the continuation of abnormal warmth and ample moisture in central valleys and central-northern States, livestock are still grazing in northern sections. In the West, cold stormy weather and snow caused livestock to suffer considerably in many places with, however, no appreciable losses. Snow over the Rocky Mountains increased grazing areas and water supplies in many places but feeding is more general at present.

Instead of the normal seasonal decreases, both the number of milk cows and production per cow appear to have increased during October and total milk production on November 1 was apparently 5 or 6 % heavier than on that date last year.

French West Africa : In Senegal livestock which have suffered from the shortage of pasture grass during the year have been attacked by a rather grave epidemic of cattle disease in some districts but energetic preventive measures have been taken. In Guinea the epidemic persisted rather severely in some areas where 7-8 % of the livestock was decimated. In Dahomey the livestock situation is good.

Algeria : In the Centre and West, the condition of livestock is excellent. In the East, on the contrary, in the department of Constantine, the condition of livestock leaves much to be desired; pastures are very poor and fodder scarce; there is an accentuated tendency to falling prices of livestock and a rise in fodder prices; wintering promises to be very difficult.

French Morocco : The condition of livestock is showing considerable and continued improvement thanks to the abundance of pasture grass.

Union of South Africa : Serious drought continued practically throughout the Union until late in October, the cold spell at the beginning of the month being followed by a period of very hot weather and much wind. Very general rains fell, however, after the end of October, more particularly in the Orange Free State and Transvaal.

The effects of the drought on grazing were severely felt in the northern Provinces and the Eastern Cape Province, especially on the Natal highveld, and stock fell off considerably in condition owing to the very dry condition of the veld and the limited water supply.

Livestock in Denmark.

There follow the figures for horses and cattle as on 15 July, compared with those for the preceding years. The figures for pigs were published here in August.

	15. VII 1931	15. VII 1930	15. VII 1929	15. VII 1928	15. VII 1927	15. VII 1926	15. VII 1925	15. VII 1924	15. VII 1923	15. VII 1922	15. VII 1921
	Thousands.										
Horses . . .	408	494	521	519	525	548	536	548	562	576	598
Cattle . . .	3.197	3.057	3.036	3.016	2.913	2.838	2.758	2.667	2 523	2 525	2.591
of which cows over two years	1.660	1 603	1.583	1.541	1.514	1.480	1.391	1.369	1.330	1.311	1.272

Horses, which have declined almost continuously for a decade, show a slight revival in 1931 but their numbers are still 6.7 % below those of 1921.

Cattle continue to increase, their number in 1931 exceeding that of a decade ago by 23.4 % ; for cows over two years the increase is still more marked, being 31.3 %

Livestock in the Irish Free State.

The statistics in the following table refer to the situation at 1 June of each year ; for the years 1918 to 1924 inclusive the estimates had to be made from sample returns.

YEARS	Thousand head								
	Cattle					Pigs		Sheep	Horses
	Total	Milch Cows	Heifers Cow	Other Cattle, under one year	Other Cattle, one year old and under two	Total	Brood Sows		
1921	4,419	1,278	101	1,022	894	891	90	3 020	490
1922	4,375	1,289	103	984	905	933	98	2,794	487
1923	4,278	1,269	107	972	857	1,186	124	2,666	473
1924	4,268	1,261	106	988	834	987	95	2,726	460
1925	3,991	1,183	81	919	771	731	75	2,813	434
1926	3,947	1,184	98	927	747	884	93	3,003	424
1927	4,047	1,234	97	1,001	780	1,178	124	3,120	429
1928	4,125	1,231	84	1,008	879	1,183	115	3,264	434
1929	4,137	1,227	85	1,010	875	945	96	3,375	436
1930	4,038	1,225	87	938	875	1,052	111	3,515	448
1931	4,029	1,222	78	995	856	1,227	125	3, 575	450

While the tendency to decline in the number of cattle from the maximum of 1921, up to which there had been a steady increase, has been continued, the decrease this year has been a relatively slight one of 0.2 %. The number of milch cows has remained very

constant since the commencement of statistical records in the middle of last century and this year, as last, only the slight decrease of 0.2 %, is registered. The heavy decline of 9.7 % in heifers in calf has more than neutralized last year's increase, bringing the figure to one of the lowest recorded. As regards cattle other than milch cows, heifers in calf and bulls, those under one year are the only category registering an increase this year, the rise of 6.0 % having not, however, made up for last year's decrease; cattle one year old and under two, two years old and under three, and three years old and upward show respectively decreases of 2.2 %, 5.1 %, and 1.1 %.

The upward swing in the pig population has continued, with an increase of 16.6 %, against last year's 11.3 %, a level higher than the maximum of the preceding cycle having now been attained. The increase in brood sows has been 12.2 %.

The increase in sheep from the 1923 minimum continues though the rate of increase this year, 1.7 %, has slowed down.

Horses show a further increase of 0.4 %.

YEAR	Thousands				
	Fowls	Ducks	Geese	Turkeys	Total
1913	14,202	2,703	1,567	837	19,309
1915	13,026	2,316	1,158	779	17,279
1916	16,532	2,655	1,300	879	21,367
1917	16,780	2,599	1,300	904	21,584
1918	16,771	2,725	1,249	969	21,714
1919	17,283	2,388	1,272	1,146	22,089
1920	18,181	2,354	1,238	1,127	22,900
1921	18,182	2,387	1,174	1,080	22,782

In poultry there has been a slight decrease of 0.5 % on last year's record figure. The number of ordinary fowl remains practically stationary, while there are further decreases in geese and turkeys and an increase in ducks.

Livestock in Latvia.

In the following table are given the numbers of livestock in Latvia in 1931 compared with those for the ten preceding years

	Horses	Cattle (Thousands)	Sheep	Pigs
1931	366.3	1,116.9	923.1	712.1
1930	359.0	1,026.3	872.9	522.7
1929	356.3	978.4	905.5	382.2
1928	365.2	960.6	1,090.4	535.0
1927	369.3	966.6	1,127.5	534.6
1926	365.0	955.0	1,152.0	521.0
1925	351.9	915.8	1,181.6	497.1
1924	340.2	905.0	1,235.0	458.0
1923	341.2	910.9	1,488.2	487.3
1922	303.0	810.5	1,161.5	402.0
1921	282.5	799.5	1,132.0	482.0
1920	261.0	768.0	978.0	481.0
1913	320.0	912.0	996.0	557.0

In the course of the last ten years the numbers of horses increased rapidly, reaching its maximum in 1927, in the following years there was a downward movement but in 1930 a revival, which was still more marked in 1931 so that the number is now 29.7 % above that of 1921 and 14.5 % above the pre-war figure

Cattle continue their steady increase and this year are 45.4 % above that of ten years ago and 22.5 % above the pre-war level.

Sheep have steadily declined in numbers since 1923, when they attained their maximum, but in 1931 there was a very considerable increase on the preceding year; the figure is still, however, 18.5 % below that of 1921 and 7.3 % below that of pre-war.

Pigs, after a sharp decline in 1929, have shown a marked increase and in 1931 numbered 36.2 % more than in 1930, 47.7 % more than in 1921 and 27.8 % more than in the pre-war years.

Livestock in Poland.

Since 1929 the Central Statistical Office has on 30 June each year carried out an enumeration of livestock. The provincial data for 1931 are now known and according to the Statistical Office the final data will not show any great difference.

In the last three years the livestock situation has been as follows :

Years	Thousands				
	Horses	Cattle	Sheep	Goats	Pigs
1931	4,123	9,782	2,594	238	7,314
1930	4,103	9,400	2,492	227	6,047
1929	4,047	9,057	(1)2,523	...	4,829

In comparison with 1929 the years 1930 and 1931 show a continuous increase for all categories. The increase in pigs in 1930 is particularly notable, though to place it at its proper value it is necessary to bear in mind that according to the census of 30 November 1929 the number of pigs was 6,333,000 and that the heavy decrease in the number enumerated on 30 June 1929 was in part determined by the unfavourable market situation for pigs and in part to the exceptionally severe winter of 1928-29 and to diseases which caused heavy mortality. For the other categories the data of the census of 30 November 1927 are as follows : horses 4,127,000 ; cattle 8,602,000 ; sheep 1,918,000.

The increase in 1931 with respect to 1930 was 20.9 % for pigs, 5 % for goats, 4.1 % for cattle and sheep and 0.5 % for horses.

Livestock in Czechoslovakia.

According to the final annual estimates made by the Ministry of Agriculture in collaboration with the Central Office of Statistics of the numbers of cattle, sheep and pigs, estimates which will in the future be made every year, the livestock situation in Czecho-

(1) Including goats.

slovakia on December 31, 1930 compared with the data of the Census of December 31, 1925 and those of the pre-war period (1910 for Bohemia, Moravia and Silesia and 1911 for Slovakia and sub-Carpathian Russia) was as follows :

	Cattle (total)	Cows	Sheep	Pigs
1930	4,457,522	2,433,830	607,612	2,776,215
1925	4,691,320	2,331,461	861,128	2,539,201
1910-1911	4,595,614	2,298,061	1,322,342	2,515,782

In 1930, the largest decrease compared with 1925 was that for sheep — 29.4 % , the total number of cattle has decreased by 5 % whereas the number of cows has increased by 4.4 % and that of pigs by 9.3 %. Compared with the pre-war period the number of sheep has decreased by 54.1 % and that of cattle by 3 % ; the number of cows has, on the contrary, increased by 5.9 % and that of pigs by 10.4 %.

It is interesting to compare the data of 31 December 1930 with those of the census of 27 May 1930 as some indication is obtained of the seasonal variations in the numbers of the different kinds from the summer to the winter.

In fact, the decrease as on 31 December was 81,382 head (1.8 %) for cattle, 311,810 (10.1 %) for pigs and 228,437 (27.3 %) for sheep.

The relatively small decrease for cattle may be partly explained by the fact that in some sections of the country (Slovakia and sub-Carpathian Russia) livestock are kept largely on pastures.

For pigs the decrease is much larger and may be explained on examination of the variation in the composition of the herds according to age of the animals depending largely on fodder supplies and pig breeding conditions in the summer and winter. In fact, the number of pigs under 6 months old fell from 1,971,355 head in June to 1,361,767 in December, that is by 31.1 %. “ Other pigs ” (excluding boars and sows for reproduction) six months old and over have, on the contrary, increased from May to December from 653,053 to 948,635 head, that is, by 48.3 %.

As regards sheep excluding those under one year old, the number in May was 562,933 and in December, excluding those under six months old, 566,436.

Numbers of livestock per square kilometre and per 1000 inhabitants.

	Per sq. kilometre			Per 1000 inhabitants		
	Cattle	Pigs	Sheep	Cattle	Pigs	Sheep
1930	31.8	19.8	4.3	302.7	188.5	41.3
1925	33.4	18.1	6.1	329.3	178.3	60.5
1920	31.2	14.6	7.0	321.7 (1)	150.9	72.4
1910-1911	32.7	17.9	9.4	338.0	185.1	97.4

(1) Excluding “ other pigs over 1 year old ”.

Poultry in Chile.

As complementary data to the census of livestock of June 30, 1930, the following figures are given of the numbers of poultry in Chile in 1930 compared with 1925.

Poultry	1930 (Head)	1925
Fowls	1,988,057	1,590,350
Geese	119,113	120,498
Ducks	104,265	102,147
Turkeys	148,824	128,438

Compared with 1925 there is an increase for all kinds except geese, which show a decrease of 1,385 head.

South African Mohair Clip.

Despite the increase in numbers of Angora goats recorded in June 1930 as compared with the previous year the exports of mohair during the 1930-31 season showed a very substantial falling off. On 30 June 1931 no falling off in the numbers of Angora goats was registered but the view has been expressed in responsible quarters that if the depression in the mohair market continues farmers will change over more and more to merino sheep and particularly to Blackhead Persians.

In the current season the Angora goat area enjoyed excellent rains during the winter and the veld was particularly good in some districts. The winter clip was expected to be on the strong side but naturally well-grown. The prospects for the summer clip depended, of course, on the rainfall later in the season, but otherwise conditions were favourable, the farms not being overstocked and the goats being generally in fine condition. Winter kidding was expected to be below normal owing to deliberate restrictions on the part of many farmers.

TRADE

COUNTRIES	OCTOBER				THREE MONTHS (August 1-October 31)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1931	1930	1931	1930	1931	1930	1931	1930	1930-31	1930-31
Wheat. — Thousand centals (1 cental = 100 lbs)										
<i>Exporting Countries:</i>										
Bulgaria	802	62	0	0	1,885	758	0	0	3,234	0
Hungary	1,647	522	0	0	3,331	1,949	0	0	5,247	0
Lithuania	0	7	0	0	0	15	0	0	545	0
Rumania	3,444	1,285	0	0	14,473	4,879	0	0	8,675	7
U S S R	—	—	—	—	(1) 22,919	(1) 14,617	—	—	67,052	—
Yugoslavia	924	377	0	0	4,557	1,983	0	0	3,247	0
Canada	11,356	17,871	13	11	27,102	45,144	33	13	137,150	79
United States	7,123	3,664	1,122	1,673	17,511	22,481	2,588	4,130	46,355	11,616
Argentina	3,217	2,436	—	—	10,203	6,140	—	—	71,553	—
Chile	0	95	0	0	0	392	0	0	428	0
India	26	260	0	302	119	1,706	176	547	2,216	6,581
Turkey	—	—	—	—	(1) 31	(1) 75	(1) 0	(1) 4	265	7
Algeria	—	—	—	—	(1) 756	(1) 2,227	(1) 482	(1) 37	5,706	1,371
Tunis	170	104	44	9	1,250	1,034	104	20	3,704	542
Australia	3,115	3,027	0	0	9,656	6,742	0	0	78,505	0
<i>Importing Countries:</i>										
Germany	1,682	2	1,444	2,154	3,558	11	3,084	6,803	265	18,805
Austria	0	2	483	358	0	60	1,268	979	86	5,315
Belgium	381	40	3,417	2,240	1,468	64	9,162	8,642	2,079	30,082
Denmark	2	2	1,592	322	9	13	3,100	911	35	4,877
Spain	0	0	0	0	0	2	0	0	4	0
Estonia	0	0	42	82	0	0	108	154	0	370
Irish Free State	0	7	838	595	0	7	2,251	1,894	18	6,435
Finland	0	0	22	0	0	0	55	0	0	90
France	2	18	4,038	3,849	4	941	14,484	9,698	966	46,606
Gr Brit and N. Ir.	46	60	16,246	11,061	132	201	47,622	32,529	683	124,551
Greece	0	0	1,310	1,484	0	0	3,702	3,768	0	14,283
Italy	4	15	606	5,212	18	15	1,693	11,735	18	50,116
Latvia	0	0	66	101	0	0	170	412	0	1,080
Norway	—	—	408	516	—	—	646	1,045	—	3,126
Netherlands	9	15	1,012	1,559	24	24	3,761	5,196	688	16,599
Poland	37	229	33	4	161	485	73	22	1,847	49
Portugal	—	—	2	18	—	—	886	73	—	1,316
Sweden	0	4	278	452	0	15	660	1,175	31	2,879
Switzerland	0	0	1,574	1,321	0	0	3,878	3,305	2	11,096
Czechoslovakia	2	0	1,314	503	2	2	3,509	1,790	4	7,079
Japan	—	—	1,113	880	—	—	2,575	1,795	—	15,311
Syria and Lebanon	73	9	0	0	276	71	0	9	137	44
Egypt	—	—	—	—	(2) 0	(2) 0	(2) 82	82	2	1,019
Union of South Africa	—	—	—	—	(1) 0	(1) 0	(1) 271	236	0	1,601
New Zealand	—	—	—	—	(1) 0	(1) 0	(1) 15	15	0	125
Totals	34,062	30,093	37,917	34,681	119,445	112,003	106,756	97,135	438,742	383,960
Rye. — Thousand centals (1 cental = 100 lbs).										
<i>Exporting Countries:</i>										
Germany	584	245	414	99	1,038	922	783	174	1,213	690
Bulgaria	254	99	0	0	650	291	0	0	1,413	0
Hungary	148	112	0	0	348	328	0	0	1,579	0
Poland	212	935	15	0	743	3,102	29	0	5,880	2
Rumania	359	132	0	0	926	306	0	0	1,239	0
U. S. S. R.	—	—	—	—	(1) 4,409	(1) 2,132	—	—	(3) 11,023	—
Yugoslavia	0	0	0	2	0	0	0	2	0	4
Canada	40	238	0	0	392	238	0	0	1,171	0
United States	0	22	—	—	13	46	—	—	90	—
Argentina	51	79	—	—	198	170	—	—	992	—
Turkey	—	—	—	—	(1) 86	(1) 163	(1) 0	(1) 0	308	0
Algeria	—	—	—	—	(1) 4	(1) 13	(1) 0	(1) 0	85	0
<i>Importing Countries:</i>										
Austria	0	0	101	99	0	4	269	304	9	2,205
Belgium	55	0	388	298	146	9	822	575	126	3,739
Denmark	0	0	578	977	0	0	1,676	2,105	4	7,324
Estonia	0	0	0	13	0	0	4	31	0	194
Finland	0	0	77	452	0	0	201	743	2	1,570
France	0	0	243	82	0	0	395	287	0	1,378
Italy	0	0	9	44	0	0	29	172	0	597
Latvia	0	0	9	11	0	0	40	128	0	260
Lithuania	0	0	0	0	0	11	2	0	163	0
Norway	0	0	350	119	0	0	897	606	0	3,023
Netherlands	20	9	613	423	137	20	1,563	1,330	791	6,323
Sweden	0	0	161	119	0	0	218	282	4	520
Switzerland	0	0	9	22	0	0	31	57	0	174
Czechoslovakia	0	90	1,014	4	2	236	1,790	24	476	844
Totals	1,723	1,961	3,999	2,764	9,092	8,011	8,758	6,726	26,578	28,847

(1) (2) (3) See notes page 798.

COUNTRIES	OCTOBER				THREE MONTHS (August 1-October 31)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1931	1930	1931	1930	1931	1930	1931	1930	1930-31	1930-31
Wheat flour. — Thousand centals (1 cental = 100 lbs.)										
<i>Exporting Countries:</i>										
Germany	2	20	11	20	7	97	49	60	123	238
Belgium	9	15	4	29	20	44	22	64	216	231
Bulgaria	71	9	0	0	205	31	0	0	220	0
Spain	0	0	0	0	4	9	0	0	75	0
France	578	311	24	60	2,002	1,479	90	187	7,350	569
Hungary	306	593	0	0	556	1,521	0	0	4,008	0
Italy	205	104	29	13	472	258	68	44	1,179	225
Latvia	0	4	0	0	0	31	0	0	73	2
Poland	77	88	2	2	163	172	2	7	615	24
Rumania	60	57	0	0	132	154	0	0	425	0
Yugoslavia	4	22	0	0	11	37	0	0	88	2
Canada	1,093	1,394	4	7	3,210	4,264	11	18	13,113	49
United States	1,539	2,006	0	0	4,182	7,778	7	0	23,164	2
Argentina	90	168	—	—	403	520	—	—	2,044	—
Chile	2	20	0	0	7	55	0	0	104	0
India	90	80	0	0	234	202	2	0	1,014	2
Turkey	—	—	—	—	(1)	0 (1)	4 (1)	2 (1)	0	29
Japan	137	375	3	31	677	944	37	106	3,472	212
Algeria	—	—	—	—	(1)	20 (1)	62 (1)	7 (1)	207	57
Tunis	4	15	2	2	44	57	2	7	251	11
Australia	1,060	820	0	0	4,431	2,533	0	0	10,404	0
<i>Importing Countries:</i>										
Austria	0	2	99	207	2	2	179	432	13	3,100
Denmark	0	2	152	181	4	9	384	450	24	1,572
Estonia	0	0	2	13	4	0	0	35	2	83
Irish Free State	2	2	414	364	9	15	1,032	983	40	3,636
Finland	—	—	262	456	—	—	608	899	—	2,150
Gr. Britain and N. Ir.	498	445	1,164	1,321	1,238	1,237	3,131	3,915	4,608	12,816
Greece	—	—	7	26	—	—	234	66	—	165
Norway	0	0	108	154	2	0	377	474	2	1,896
Netherlands	18	7	88	357	26	31	285	1,001	115	3,345
Portugal	—	—	31	15	—	—	65	42	—	218
Sweden	0	0	4	9	0	2	11	35	2	71
Czechoslovakia	2	2	143	421	2	4	315	970	11	2,432
Ceylon	—	—	44	42	—	—	106	132	—	445
Java and Madura	—	—	—	—	—	—	(2)	93 (2)	95	1,025
Indo-China	—	—	31	37	—	—	108	115	—	428
Syria and Lebanon	15	0	13	18	44	2	82	20	22	168
Egypt	—	—	—	—	(2)	0 (2)	0 (2)	168 (2)	229	0
Union of South Africa	—	—	—	—	(1)	0 (1)	4 (1)	4 (1)	42	11
New Zealand	—	—	—	—	(1)	0 (1)	0 (1)	40 (1)	35	2
Totals	5,811	7,567	2,651	3,785	18,161	21,638	7,292	10,488	73,091	39,399
Barley. — Thousand centals (1 cental = 100 lbs.)										
<i>Exporting Countries:</i>										
Bulgaria	82	152	0	0	239	597	0	0	1,598	0
Spain	0	13	0	0	4	51	0	0	152	0
Hungary	13	112	0	0	37	194	0	0	580	4
Lithuania	0	0	0	0	0	7	0	0	15	0
Rumania	752	540	0	0	1,160	1,221	0	0	2,798	0
Czechoslovakia	2,917	4,266	0	0	8,689	14,632	0	0	32,778	0
U. S. S. R.	280	988	0	0	397	1,482	0	0	8,003	4
Canada	106	251	0	0	7,055 (1)	5,249	—	—	(3)	22,906
United States	351	562	—	—	2,048	322	0	0	9,240	0
Argentina	51	463	—	—	1,144	1,868	—	—	5,022	—
Chile	—	33	0	0	227	893	—	—	5,701	—
India	0	0	0	0	40	137	0	0	536	0
Syria and Lebanon	7	55	29	0	2	2	0	0	302	2
Turkey	—	—	—	—	214	148	46	0	869	7
Algeria	—	—	—	—	(1)	336 (1)	62 (1)	0 (1)	593	0
Egypt	—	—	—	—	(1)	123 (1)	354 (1)	854 (1)	4	1,444
Tunis	—	—	—	—	(2)	0 (2)	0 (2)	42 (2)	9	2
Australia	4	26	154	55	110	137	240	128	220	390
<i>Importing Countries:</i>										
Germany	0	11	1,473	1,332	0	34	3,100	3,040	62	17,906
Austria	0	0	331	209	0	0	639	562	0	2,077
Belgium	179	4	1,221	1,210	322	33	2,754	2,385	1,076	10,538
Denmark	75	194	511	1,515	82	214	1,631	3,107	1,232	15,007
Estonia	—	—	0	9	—	—	0	0	—	13
Irish Free State	4	0	4	2	4	0	11	7	20	454
France	4	4	961	858	7	7	1,905	1,343	22	7,710
Gr. Britain and N. Ir.	2	2	2,633	2,560	2	7	5,948	4,857	68	18,691
Greece	—	—	0	11	—	—	0	22	—	70
Italy	0	0	97	90	0	0	137	157	0	778
Latvia	0	0	0	24	0	0	2	49	0	212
Norway	0	0	66	68	0	0	159	104	0	1,078
Netherlands	42	31	1,413	1,881	57	68	3,051	3,920	591	19,716
Switzerland	0	0	304	304	0	0	571	639	0	2,829
Yugoslavia	0	0	13	18	9	9	33	53	29	130
Totals	4,871	7,727	3,260	10,646	22,448	27,836	21,153	20,539	92,471	93,242

(1) (2) (3) See notes page 798.

COUNTRIES	OCTOBER				THREE MONTHS (August 1-October 31)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1931	1930	1931	1930	1931	1930	1931	1930	1930-31	1930-31
Oats. — Thousand centals (1 cental = 100 lbs).										
<i>Exporting Countries:</i>										
Germany	0	20	40	9	2	179	154	20	220	1,005
Irish Free State	20	35	42	29	29	75	123	44	254	452
Hungary	0	2	0	0	2	7	0	0	13	141
Lithuania	0	2	0	0	0	37	0	0	81	0
Poland	4	7	0	0	9	68	0	0	137	0
Rumania	77	258	0	0	236	699	0	0	1,789	0
Czechoslovakia	26	132	2	0	99	323	53	4	710	143
U S S R	0	0	—	—	—	—	—	—	(3) 9,513	—
Yugoslavia	0	0	0	13	0	0	0	66	2	86
Canada	368	117	139	2	860	247	302	212	2,659	234
United States	216	7	0	11	388	46	0	11	130	198
Argentina	787	1,510	—	—	2,498	2,657	—	—	14,621	—
Chile	9	251	0	0	44	721	0	0	2,178	0
Algeria	—	—	—	(1)	9 (1)	55 (1)	190 (1)	99	1,292	225
Tunis	26	75	0	0	106	251	0	0	545	9
<i>Importing Countries:</i>										
Austria	0	0	115	139	0	2	298	379	2	2,227
Belgium	0	0	77	584	0	0	386	1,065	4	3,494
Denmark	9	0	18	62	20	0	196	163	20	1,270
Estonia	0	0	2	7	0	0	2	20	0	159
Finland	2	0	4	7	2	0	40	22	7	260
France	0	2	97	236	2	7	357	542	20	2,213
Gr. Brit. and N. Irel.	7	2	935	1,488	22	18	2,732	2,238	397	10,097
Italy	0	0	267	344	0	0	681	794	0	3,741
Latvia	0	0	4	4	0	0	7	18	4	57
Norway	0	0	11	0	0	0	73	0	4	4
Netherlands	4	4	187	289	13	13	534	613	375	3,609
Sweden	0	4	104	148	0	11	403	240	40	1,334
Switzerland	0	0	337	302	0	0	1,010	935	2	4,564
Australia	4	1	0	0	15	20	0	0	73	2
Totals	1,539	3,441	2,381	3,614	4,356	5,441	7,541	7,530	35,045	36,124

Maize. — Thousand centals (1 cental = 100 lbs).

COUNTRIES	OCTOBER				THREE MONTHS (August 1-October 31)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1931	1930	1931	1930	1931	1930	1931	1930	1930-31	1930-31
Maize. — Thousand centals (1 cental = 100 lbs).										
<i>Exporting Countries:</i>										
Bulgaria	95	564	0	0	3,477	4,017	0	0	—	—
Hungary	2	24	75	26	249	3,351	2,337	132	—	—
Rumania	1,124	1,149	0	0	17,756	28,424	0	2	—	—
Yugoslavia	20	353	15	13	6,420	12,006	24	33	—	—
United States	112	132	4	262	1,386	4,303	520	708	—	—
Argentina	22,769	11,405	—	—	198,617	96,331	—	—	—	—
Brazil	—	—	—	—	(1) 18 (1)	326	—	—	—	—
Java and Madura	53	24	—	—	2,407	1,750	—	—	—	—
Indo-China	414	448	—	—	2,277	2,339	—	—	—	—
Syria and Lebanon	2	22	0	2	159	434	49	35	—	—
Egypt	—	—	—	(2)	4 (2)	20 (2)	139 (2)	18	—	—
Union of South Africa	—	—	—	(1)	2,185 (1)	9,423 (1)	0 (1)	0	—	—
<i>Importing Countries:</i>										
Germany	0	0	966	1,202	0	0	10,007	16,506	—	—
Austria	0	0	692	245	2	18	6,270	4,312	—	—
Belgium	163	11	1,418	1,175	955	220	17,075	12,903	—	—
Denmark	0	0	1,338	767	0	0	13,539	6,248	—	—
Spain	0	0	212	82	0	0	3,666	3,840	—	—
Irish Free State	0	0	1,521	710	26	29	12,044	8,047	—	—
Finland	—	—	53	18	—	—	355	137	—	—
France	2	0	3,307	3,124	40	46	23,515	17,359	—	—
Gr. Brit. and N. Ir.	245	258	7,024	4,957	2,407	2,150	53,281	36,306	—	—
Greece	—	—	11	0	—	—	373	185	—	—
Italy	0	0	1,680	1,091	7	7	17,447	15,252	—	—
Norway	—	—	328	390	—	—	3,977	2,678	—	—
Netherlands	9	13	3,618	2,220	273	626	32,441	23,173	—	—
Poland	0	0	26	22	0	4	496	392	—	—
Portugal	—	—	134	143	—	—	1,605	1,442	—	—
Sweden	—	—	809	183	—	—	7,311	2,262	—	—
Switzerland	0	0	608	381	2	0	3,611	2,542	—	—
Czechoslovakia	0	0	1,700	551	2	2	13,115	5,443	—	—
Canada	0	0	787	822	9	4	4,760	7,573	—	—
Japan	—	—	123	79	—	—	1,689	1,486	—	—
Tunis	0	0	26	0	9	2	298	0	—	—
Totals	25,910	14,403	26,475	18,495	258,628	165,941	223,944	169,017	—	—

(1) (2) (3) See notes page 798.

COUNTRIES	OCTOBER				TEN MONTHS (January 1-October 31)				TWELVE MONTHS (January 1-Dec. 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1931	1930	1931	1930	1931	1930	1931	1930	1930	1930
Rice. — Thousand centals (1 cental = 100 lbs)										
<i>Exporting Countries:</i>										
Spain	75	57	0	0	606	858	0	0	1,252	0
Italy	231	437	2	11	2 385	3,574	51	130	4,716	134
United States	324	154	11	13	2,191	1,819	276	229	2,615	293
Brazil	—	—	—	—	(1) 1,649 (1)	714	—	—	844	—
India	3,007	2 853	24	46	41,110	52,633	467	71	57,318	139
Indo-China	1,131	1,409	—	—	17,075	19,648	—	—	21,998	—
Siam	1,962	1,325	—	—	20 410	13,029	—	—	20,598	—
Egypt	—	—	—	—	(2) 525 (2)	721 (2)	302 (2)	168	1,206	261
<i>Importing Countries:</i>										
Germany	192	123	871	522	1,140	1,382	7,641	4,874	1,594	5,503
Austria	0	0	42	35	0	0	496	494	0	606
Belgium	15	0	112	60	150	7	1,132	889	9	1,047
Denmark	0	0	13	11	0	0	123	106	0	130
Estonia	—	—	4	4	—	—	29	33	—	35
Irish Free State	0	0	2	2	0	0	44	37	0	46
France	97	297	875	754	794	1,634	5,670	4,766	1,903	5,650
Gr. Brit. and N. Ir	60	13	280	203	223	194	2,216	2,165	218	2,584
Greece	—	—	33	37	—	—	445	428	—	336
Hungary	0	0	64	99	2	7	401	293	9	338
Latvia	0	0	4	7	0	7	71	53	7	62
Lithuania	0	0	4	4	0	0	20	26	0	31
Norway	—	—	4	9	—	—	99	88	—	101
Netherlands	214	170	203	29	2,161	1,735	4,786	3,206	2,035	3,363
Poland	115	9	131	0	414	100	1,684	1,175	126	1,177
Portugal	—	—	49	68	—	—	516	793	—	941
Sweden	—	—	0	0	—	—	123	161	—	161
Switzerland	0	0	40	64	0	0	342	315	0	408
Czechoslovakia	0	0	104	79	0	0	830	847	0	979
Yugoslavia	0	0	37	60	2	2	292	350	2	510
Canada	0	0	42	20	0	0	613	487	0	584
Chile	—	—	24	20	—	—	463	459	—	315
Ceylon	0	0	860	838	15	7	3,622	9,116	9	10,800
Java and Madura	—	—	—	—	(2) 174 (2)	49 (2)	4 308 (2)	1,497	117	5,437
Japan	132	126	245	470	4,118	289	2 317	3,343	1,252	3,973
Syria and Lebanon	0	0	31	20	0	2	262	238	2	320
Turkey	—	—	—	—	(1) 0 (1)	2 (1)	137 (1)	134	2	203
Algeria	—	—	—	—	(1) 2 (1)	7 (1)	101 (1)	71	9	104
Tunis	0	0	0	2	0	0	26	18	0	24
Union of S. Africa	—	—	—	—	(1) 0 (1)	0 (1)	829 (1)	725	0	930
Australia	26	7	0	7	130	62	24	68	71	75
New Zealand	—	—	—	—	(1) 0 (1)	0 (1)	64 (1)	55	0	66
Totals	7,581	6,890	4,168	3,502	35,376	103,488	46,020	41,186	117,912	48,363
Linseed. — Thousand centals (1 cental = 100 lbs)										
<i>Exporting Countries:</i>										
Estonia	0	22	0	0	2	24	0	2	55	2
Lithuania	13	130	0	0	143	227	0	0	443	—
Argentina	3,272	1,389	—	—	36,786	20,970	—	—	25,466	—
India	225	276	0	0	2 028	5,507	0	0	5,763	0
Tunis	0	0	0	0	4	9	0	0	9	0
<i>Importing Countries:</i>										
Germany	0	0	399	403	11	24	6,430	4,539	26	5,194
Belgium	42	4	375	75	128	62	3,276	1,239	68	1,676
Denmark	—	—	37	40	—	—	373	309	—	369
Spain	—	—	35	55	—	—	368	381	—	419
Finland	0	0	0	7	0	0	51	71	0	79
France	0	2	776	421	15	13	4,945	3,649	15	4,288
Gr. Brit. and N. Irel	0	0	639	473	9	9	6 389	3,735	9	5,081
Greece	0	0	13	9	0	2	34	60	2	64
Hungary	4	20	0	0	35	194	2	106	143	106
Italy	0	0	137	112	0	0	1,151	866	0	1,175
Latvia	4	55	4	18	62	132	77	82	236	168
Norway	—	—	0	37	—	—	234	306	—	357
Netherlands	0	7	955	533	46	137	8,197	4,879	146	5,617
Poland	0	2	0	2	—	271	271	143	31	150
Sweden	—	—	49	64	7	26	970	724	—	798
Czechoslovakia	0	2	35	44	4	15	489	381	18	445
Yugoslavia	0	0	4	4	0	2	117	121	2	121
Canada	0	37	64	0	483	265	90	452	783	454
United States	—	—	822	84	—	—	7,308	6,751	—	7,090
Japan	—	—	0	22	—	—	150	110	—	126
Australia	0	0	4	24	0	0	267	313	0	840
Totals	3,560	1,975	4,348	2,437	39,758	27 558	41,189	29,331	33,215	34,659

(1) (2) See notes page 798.

COUNTRIES	OCTOBER				TEN MONTHS (January 1-October 31)				TWELVE MONTHS (January 1-Dec 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1931	1930	1931	1930	1931	1930	1931	1930	1930	1930
Butter. — (Thousand lbs).										
<i>Exporting Countries:</i>										
Austria	509	734	24	2	2,381	3,382	1,559	510	4,112	645
Denmark	33,793	32,190	163	9	320,454	316,223	1,440	1,299	372,558	1,389
Estonia	3,230	4,244	0	0	28,402	27,598	0	0	31,010	0
Irish Free State	5,110	5,584	40	53	39,386	55,032	3,258	2,054	58,815	3,391
Finland	2,244	3,027	0	0	33,528	32,494	0	2	37,726	7
France	1,314	979	5,172	271	8,979	9,705	40,135	10,269	12,053	12,924
Hungary	955	516	0	0	2,877	2,943	117	40	3,440	40
Latvia	4,004	4,725	0	7	36,447	36,810	22	37	40,630	49
Lithuania	2,097	2,094	0	0	17,783	14,626	0	0	16,219	0
Netherlands	6,158	7,438	974	542	64,940	80,771	5,483	2,818	92,394	4,392
Poland	7,427	2,943	2	4	25,450	24,116	31	26	26,714	29
Sweden	3,743	5,247	13	0	38,118	50,603	29	15	58,857	18
U. S. S. R.	—	—	—	—	(4)	18,052 (4)	7,677	—	23,149	—
Argentina	4,085	4,579	—	—	34,540	37,404	—	—	51,156	—
India	24	33	37	22	278	434	282	218	551	232
Syria and Lebanon	101	108	49	77	1,609	1,753	289	165	2,161	172
Australia	18,049	14,127	0	0	160,433	86,635	0	2	126,411	2
New Zealand	14,848	18,534	—	—	163,866	165,733	—	—	208,170	—
<i>Importing Countries:</i>										
Germany	22	22	21,535	29,815	258	522	181,395	246,101	578	293,560
Belgium	507	234	3,438	2,086	2,564	2,227	33,083	17,178	2,648	22,412
Spain	0	11	0	126	75	134	42	282	101	328
Gr. Brit and N. Irel	2,114	1,437	71,785	57,735	28,576	11,334	749,349	639,129	21,028	764,782
Greece	—	—	251	137	—	1,594	1,151	—	—	1,420
Italy	31	31	223	849	1,239	1,709	5,044	2,262	1,843	3,115
Norway	31	0	31	227	1,446	229	302	1,332	236	1,530
Switzerland	2	1,764	968	13	35	13,775	15,267	42	13,786	—
Czechoslovakia	115	79	163	29	483	542	3,680	679	694	714
Canada	1,834	143	0	2,242	9,720	977	2,818	98,076	1,179	38,605
United States	117	179	586	62	1,784	2,624	1,543	2,273	2,967	2,471
Ceylon	—	—	55	60	—	—	483	602	—	723
Java and Madura	—	—	—	—	—	—	(z)	5,509 (z)	—	7,557
Japan	—	—	13	33	—	—	179	529	—	611
Algeria	—	—	—	(1)	46 (1)	60 (1)	3,117 (1)	2,359	82	3,232
Egypt	—	—	—	(2)	24 (2)	11 (2)	1,548 (2)	1,684	13	2,417
Tunis	2	4	93	84	7	13	721	661	13	829
Totals	107,466	109,244	105,406	94,940	1,043,758	973,856	1,062,065	993,433	1,197,609	1,186,332
Cheese. — (Thousand lbs).										
<i>Exporting Countries:</i>										
Denmark	1,058	1,193	55	104	8,080	10,944	511	628	12,626	809
Finland	443	441	2	2	5,013	3,790	22	24	4,633	35
Italy	9,843	8,442	994	1,389	73,893	65,246	8,940	11,056	80,965	12,562
Lithuania	220	170	0	2	2,033	1,592	0	7	1,960	11
Norway	300	163	61	86	2,196	1,058	470	580	1,380	750
Netherlands	17,765	20,830	139	168	162,243	177,045	1,091	1,250	206,739	1,510
Poland	348	390	79	119	2,465	2,637	661	902	3,267	1,074
Switzerland	4,127	5,878	1,239	454	48,462	56,688	6,332	3,505	66,146	4,251
Czechoslovakia	1,805	979	295	251	7,672	6,193	3,256	2,026	8,274	2,963
Yugoslavia	597	1,034	24	29	3,468	3,338	207	256	4,583	300
Canada	21,945	16,568	154	148	69,874	61,461	1,133	1,413	66,955	1,779
Australia	1,034	800	2	0	5,262	4,941	22	140	7,273	150
New Zealand	7,798	13,858	0	0	139,035	152,247	4	4	201,266	7
<i>Importing Countries:</i>										
Germany	1,063	518	11,471	13,746	5,992	4,205	101,909	118,151	5,410	137,459
Austria	692	633	401	425	5,395	3,243	5,097	4,927	4,482	5,637
Belgium	84	97	4,544	4,751	892	756	42,014	43,279	880	51,394
Spain	13	13	346	630	220	176	3,133	4,628	207	2,586
Irish Free State	20	20	357	207	128	130	2,262	1,940	194	2,360
France	3,260	3,349	8,232	7,370	27,137	32,401	69,669	52,889	38,921	66,119
Gr. Brit. and N. Irel	701	820	31,180	24,599	6,094	7,522	265,823	282,371	8,927	348,592
Greece	13	20	485	134	157	240	2,078	2,055	262	2,392
Hungary	9	11	4	44	97	71	190	333	93	386
Portugal	—	—	117	97	—	—	633	721	—	1,010
Sweden	—	—	196	154	—	—	1,329	1,067	—	1,470
United States	141	196	7,178	6,325	1,506	1,828	50,740	53,032	2,127	63,313
India	0	0	108	112	2	4	710	873	7	1,133
Java and Madura	—	—	—	—	—	(z)	1,032 (z)	1,034	—	730
Syria and Lebanon	2	7	53	71	77	123	582	534	132	10,397
Algeria	—	—	—	(2)	130 (2)	139 (2)	5,871 (2)	7,573	212	7,553
Egypt	—	—	—	(2)	40 (2)	46 (2)	4,813 (2)	4,405	60	1,746
Tunis	0	7	132	207	22	20	1,530	1,422	29	1,746
Totals	72,328	75,757	67,851	61,644	577,435	598,394	582,982	608,651	723,650	740,299

(1) (2) (4) See notes page 793.

COUNTRIES	OCTOBER				THREE MONTHS (August 1-October 31)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1931	1930	1931	1930	1931	1930	1931	1930	1930-31	1930-31
Cotton. — Thousand cents (1 cental = 100 lbs).										
<i>Exporting Countries:</i>										
United States	5,445	5,344	13	9	9,369	12,170	77	55	36,391	538
Argentina	49	46	—	—	203	181	—	—	511	—
Brazil	—	—	—	—	33 (1)	60	—	—	516	—
India	478	880	26	51	1,940	2,906	190	179	14,045	1,847
Egypt	—	—	—	—	(2)	705 (2)	152 (2)	0 (2)	0	0
<i>Importing Countries:</i>										
Germany	174	168	496	1,089	511	459	1,307	2,240	1,706	8,442
Austria	0	0	40	44	0	0	110	115	0	467
Belgium	40	9	141	154	112	35	379	417	201	1,713
Denmark	—	—	9	15	—	—	21	31	—	154
Spain	2	2	159	152	4	7	136	470	24	2,253
Estonia	0	0	7	9	0	0	30	24	0	84
Finland	0	0	11	15	0	0	40	42	0	172
France	46	40	245	961	157	163	580	1,709	549	8,142
Gr. Brit. and N. Irel.	26	68	584	1,067	88	179	1,636	2,130	481	10,959
Greece	0	0	15	18	0	0	49	44	0	225
Hungary	—	—	22	24	—	—	60	60	—	291
Italy	0	0	249	254	0	0	679	628	2	3,821
Latvia	0	0	9	9	0	0	13	26	0	62
Norway	—	—	0	7	—	—	2	13	—	46
Netherlands	2	0	82	79	2	2	220	207	7	1,043
Poland	2	0	110	196	7	4	300	476	24	1,444
Portugal	—	—	20	81	—	—	73	64	—	333
Sweden	—	—	42	53	—	—	119	117	—	467
Switzerland	0	0	26	64	4	0	88	119	7	603
Czechoslovakia . .	15	18	190	220	37	46	472	600	154	2,368
Yugoslavia	0	0	15	20	0	0	49	51	0	185
Canada	—	—	77	128	—	—	176	223	—	1,025
Japan	148	79	658	1,052	231	163	2,555	1,881	534	13,757
Algeria	—	—	—	—	(1)	0 (1)	2 (1)	0 (1)	24	1
Totals	6,427	6,663	3,344	5,721	13,633	16,619	9,521	11,931	62,445	60,456

Wool. — (Thousand lbs).

COUNTRIES	TWO MONTHS (September 1-October 31)				TWO MONTHS (September 1-October 31)				TWELVE MONTHS (Sept. 1-August 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1931	1930	1931	1930	1931	1930	1931	1930	1930-31	1930-31
<i>Exporting Countries:</i>										
Spain	181	780	232	364	309	1,777	525	732	3,046	10,474
Irish Free State . .	1,254	575	38	36	2,302	1,276	165	132	7,965	752
Hungary	370	254	240	82	798	809	306	130	0,931	1,612
Argentina	(a) 10,538	0,382	—	—	(b) 17,597	12,840	—	—	287,424	—
Chile	55	300	—	—	—	505	—	—	4,268	—
India	55	19,659	—	—	254	19,851	—	—	47,499	—
Syria and Lebanon .	2,998	3,349	397	247	5,670	4,705	790	333	41,806	4,887
Algeria	428	994	152	578	911	1,700	306	1,334	0,315	3,944
Egypt	—	—	—	—	(1) 622 (1)	2,460 (1)	93 (1)	126	16,835	1,371
Tunis	20	35	93	154	37	53	148	254	3,752	2
Un. of S. Africa . .	(a) —	—	—	(1) —	(1) 1,131 (1)	6,344 (1)	0 (1)	0	209,750	33
Australia	(b) 100,897	94,460	18	(1) 18	(1) 121 (1)	423 (1)	0 (1)	49	4,830	500
New Zealand	(a) 6,773	4,167	0	13	145,173	183,064	26	185	749,742	2,337
(b) 814	802	0	0	0	10,697	7,476	0	33	43,923	53
(a) 977	1,737	0	0	0	1,585	6,266	0	0	172,332	0
(b) —	—	—	—	—	5,190	6,446	0	0	44,075	0
<i>Importing Countries:</i>										
Germany	(a) 2,313	494	8,933	20,829	(b) 3,549	1,257	15,545	36,165	11,305	329,621
(b) 1,455	968	2,399	2,657	2,606	2,079	4,299	4,826	13,153	30,552	14,149
Austria	4	2	589	571	24	7	983	1,127	254	138,435
Belgium	(a) 1,750	1,171	4,136	4,744	(b) 3,001	2,810	8,550	11,726	10,311	3,918
(b) 2,253	2,238	381	317	4,012	3,898	551	622	21,638	3,591	2,328
Denmark	18	0	386	205	22	9	613	522	93	430,966
Finland	0	7	179	198	2	7	348	410	84	821,498
France	4,129	3,199	13,318	19,828	8,871	7,055	23,702	41,191	51,606	3,025
Gr. Britain and N. Ir.	27,205	34,884	28,431	29,205	33,343	44,410	57,530	54,787	309,823	96,836
Greece	73	15	176	271	53	126	403	470	392	4,967
Italy	(a) 88	231	4,519	3,588	(b) 218	441	9,149	9,927	2,161	3,591
(b) 280	470	1,204	1,049	516	571	2,412	1,922	4,967	1,371	2,337
Norway	53	90	201	132	117	170	353	273	725	1,596
Netherlands	(a) 179	134	430	902	(b) 335	322	968	900	2,394	8,770
(b) 46	18	891	522	86	42	1,373	860	388	7,134	38,253
Poland	137	95	1,784	2,439	516	280	2,637	4,658	2,610	15,461
Sweden	—	—	1,658	847	—	—	2,635	1,841	—	18,922
Switzerland	141	4	2,044	2,152	203	4	2,586	2,773	366	36,952
Czechoslovakia . .	366	134	3,896	2,652	542	282	5,684	5,359	1,590	7,963
Yugoslavia	18	20	351	529	18	20	575	1,175	24	12,017
Canada	1,041	86	441	538	1,188	688	807	1,060	2,271	158,041
United States . . .	84	203	13,464	8,965	194	25,139	17,811	2,224	13	142,262
Japan	0	2	9,363	5,057	15	2	15,704	10,867	—	—
Totals	166,898	178,016	100,644	109,769	251,957	271,363	184,896	214,656	2,153,894	2,403,414

(a) = Wool, greasy; (b) = Wool, scoured.

(1) (2) See notes page 798.

COUNTRIES	OCTOBER		FOUR MONTHS (July 1-Oct. 31)		TWELVE MONTHS (July 1- June 30)	COUNTRIES	OCTOBER		FOUR MONTHS (July 1-Oct. 31)		TWELVE MONTHS (July 1- June 30)
	1931	1930	1931	1930	1930-31		1931	1930	1931	1930	1930-31
Coffee. (Thousand lbs)						Tea. (Thousand lbs)					
EXPORTS.						EXPORTS.					
<i>Exporting Countries:</i>						<i>Exporting Countries:</i>					
Brazil			(1) 485 327	520 928	2,317,260	Ceylon	16,537	16,347	68,757	73,447	247,367
India	2,094	1,777	2,368	3,700	23,400	India	48,165	47,931	169,642	181,800	347,401
Java and Madura .	4,348	5,256	19,169	20,615	38,105	Java and Madura .	13,249	12,447	49,467	42,808	158,836
<i>Importing Countries:</i>						Japan	1,711	1,444	11,100	11,129	24,315
Germany	90	44	791	132	1,345	Belgium	2	2	9	7	31
Belgium	1,066	157	3,200	540	5,090	Irish Free State .	15	9	82	53	185
France	0	7	4	53	60	France	31	2	37	13	35
Netherlands	946	1,900	3,600	4,615	13,243	Gr. Brit. and N. Ir.	10,520	9,326	31,005	31,108	87,052
Portugal	95	66	257	207	553	Netherlands	11	9	46	31	115
Switzerland	104	51	229	112	399	United States	31	49	115	207	456
Canada	4	7	15	22	55	Syria and Lebanon .	0	0	2	9	18
United States	608	1,758	5,348	8,662	24,293	Algeria . . . . .	..	..	(1) 4 (1) 2	2	22
Ceylon	0	0	2	194	227	Union of S. Africa .	..	..	(1) 18 (1) 24	24	66
Syria and Lebanon .	0	4	2	13	62	Australia	90	187	234	401	851
Australia	9	9	26	22	53	New Zealand . . . .	..	..	(1) 13 (1) 33	33	115
Totals	—	—	—	—	2,429,235	Totals	58,652	56,253	331,211	341,232	861,015
IMPORTS.						IMPORTS.					
<i>Importing Countries:</i>						<i>Importing Countries:</i>					
Germany	32,501	28,001	105,761	119,139	350,362	Germany	990	1,202	3,353	4,782	12,741
Austria	1,294	1,797	4,870	6,907	23,268	Austria	75	178	364	992	1,409
Belgium	8,841	11,341	43,777	36,432	123,457	Belgium	51	57	291	291	639
Bulgaria	71	121	336	485	1,660	Denmark	137	128	428	428	1,296
Denmark	4,014	6,152	20,433	10,066	63,224	Spain	7	43	76	119	282
Spain	4,070	20,565	14,312	31,428	68,795	Estonia	13	15	44	44	148
Estonia	31	85	86	112	309	Irish Free State . .	3,437	2,903	8,613	8,329	24,346
Irish Free State . .	46	44	134	150	525	Finland	33	22	88	84	260
Finland	4,030	7,209	12,941	17,492	40,442	France	271	311	974	916	3,586
France	27,227	35,799	147,477	132,202	405,861	Gr. Britain and N.	62,199	63,689	202,707	215,745	541,614
Gr. Britain and N.						Ireland	84	117	238	280	604
Ireland	3,170	3,404	12,375	12,564	37,858	Greece	88	114	249	271	650
Greece	1,210	1,107	4,437	4,323	12,959	Hungary	40	31	86	77	326
Hungary	494	606	2,304	2,496	7,503	Latvia	11	18	40	62	170
Italy	8,342	8,598	30,373	31,462	98,430	Lithuania	18	15	53	62	170
Latvia	40	20	141	119	351	Norway	48	38	123	130	388
Lithuania	40	42	141	165	478	Netherlands	2,725	2,498	10,276	10,020	32,512
Norway	2,754	3,514	12,928	11,709	37,690	Poland	353	401	1,381	1,497	4,614
Netherlands	9,347	11,116	36,661	34,139	100,483	Portugal	49	57	225	108	597
Poland	1,435	1,724	5,637	5,970	17,389	Rumania . . . . .	..	..	201	..	(3) 838
Portugal	796	783	3,252	3,228	11,413	Sweden	104	99	201	291	925
Rumania . . . . .	..	..	..	(3) 8,356	100,829	Switzerland	168	185	612	580	1,731
Sweden	11,155	9,273	36,775	34,214	100,829	Czechoslovakia . .	428	164	922	567	1,473
Switzerland	3,040	3,172	10,119	9,209	31,608	Yugoslavia	123	106	390	306	628
Czechoslovakia . .	5,783	1,934	13,750	8,803	23,026	Canada	3,120	3,960	8,009	14,771	43,141
Yugoslavia	1,380	2,035	6,301	8,203	20,562	United States . . .	10,271	9,916	33,324	33,777	87,151
Canada	2,037	2,595	8,494	9,481	33,689	Chile	408	564	2,208	2,008	5,362
United States . . .	119,740	153,012	486,511	483,385	1,728,578	Syria and Lebanon .	88	40	153	120	351
Chile	1,005	1,111	3,915	3,481	10,516	Turkey . . . . .	..	(1) 470 (1) 430	..	..	2,138
Ceylon	390	298	2,191	1,305	3,148	Algeria . . . . .	..	(1) 531 (1) 505	..	..	3,150
Japan	386	326	1,062	1,310	4,478	Egypt . . . . .	..	(2) 3,457 (2) 1,030	..	..	13,616
Syria and Lebanon .	207	265	756	884	2,732	Tunis	311	254	4,703	994	2,880
Turkey . . . . .	..	(1) 2,610 (1) 2,859	12,853	..	..	Union of S. Africa .	..	(1) 3,384 (1) 3,510	..	..	13,296
Algeria . . . . .	..	(1) 7,106 (1) 7,075	30,327	..	..	Australia	3,543	4,553	14,508	17,776	46,441
Egypt . . . . .	..	(2) 2,443 (2) 1,971	14,548	..	..	New Zealand . . . .	..	(1) 3,280 (1) 2,743	..	..	14,405
Tunis . . . . .	..	..	1,166	1,080	3,036	<i>Exporting Countries:</i>					
Un. of S. Africa . .	..	(1) 9,321 (1) 7,372	81,890	..	..	India	822	659	3,192	2,086	6,232
Australia	342	203	1,190 (1) 1,091	2,619	..	Java and Madura . .	..	(2) 2,948 (2) 2,414	..	..	11,830
New Zealand . . . .	..	(1) 130 (1) 119	430	..	..	Totals	96,021	92,700	311,287	327,938	891,996
<i>Exporting Countries:</i>						<i>Exporting Countries:</i>					
India	7	146	57	1,861	4,000						
Java and Madura . .	..	..	..	..	..	
Totals	256,491	316,926	1,653,107	1,854,956	3,476,837						

(1) (2) (3) See notes page 798.

COUNTRIES	OCTOBER		TWELVE MONTHS (Oct. 1-Sept. 30)		TWELVE MONTHS (Oct. 1-Sept. 30)	COUNTRIES	OCTOBER		THREE MONTHS (August 1-Oct. 31)		TWELVE MONTHS (August 1-July 31)
	1931	1930	1930-31	1929-30	1929-30		1931	1930	1931	1930	1929-1930
Cacao. (Thousand lbs.).						Total Wheat and Flour (*) (Thousand centals).					
<i>Exporting Countries:</i>						<i>Exporting Countries:</i>					
Exports.						a) NET EXPORTS					
Grenada			(2) 9,784	(2) 9,035	—	Germany	225	(5)	(5)	(5)	(5)
Dominican Republ.	1,109	1,316	61,337	42,693	—	Bulgaria	897	73	2,158	800	3,527
Brazil	—	—	146,469	162,486	—	Spain	0	0	7	13	104
Ecuador			(2) 31,819	(2) 37,388	—	Hungary	2,055	1,314	4,072	3,977	10,591
Trinidad	2,974	1,594	61,369	54,589	—	Lithuania	2	9	9	22	567
Venezuela			42,384	35,578	—	Poland	104	340	302	683	2,586
Ceylon	377	659	8,360	8,448	—	Rumania	3,523	1,862	14,650	5,084	9,235
Java and Madura	390	403	3,073	2,833	—	U. S. S. R.	—	—	(7) 22,919	(7) 14,617	(7) 67,052
Cameroon			(2) 21,237	(2) 23,087	—	Yugoslavia	930	386	(1) 4,572	(1) 1,984	3,362
Ivory Coast			(2) 44,755	(2) 46,496	—	Canada	12,796	19,076	31,334	50,792	154,489
Gold Coast	12,540	25,201	486,815	507,506	—	United States	8,054	5,485	20,496	28,715	65,021
Nigeria	3,715	3,148	113,325	123,523	—	Argentina	3,338	2,659	10,741	6,834	73,553
St. Thomas and Prince	3,492	1,424	27,011	32,800	—	Chile	—	121	2	9	463
Togoland			(2) 13,010	(2) 14,132	—	British India	159	73	254	1,510	(5)
						Syria and Lebanon	75	(5)	23	26	(5)
<i>Importing Countries:</i>						Turkey	—	—	(1) 220	(1) 77	282
Germany	0	0	454	216	—	Algeria	—	—	(1) 342	(1) 2,269	4,614
Belgium	49	13	739	304	—	Tunis	128	112	1,202	1,082	3,481
France	0	49	923	37	—	Australia	4,528	4,120	15,565	10,146	90,379
Netherlands	1,340	723	10,679	10,970	—						
Poland	0	0	0	13	—	Totals	36,816	36,030	123,886	129,096	490,010
Czechoslovakia	0	0	18	20	—						
United States	345	325	8,521	8,955	—						
Australia	31	9	86	276	—						
Totals	26,562	35,364	1,091,698	1,122,043	—						
Imports.						b) NET IMPORTS.					
<i>Importing Countries:</i>						<i>Importing Countries:</i>					
Germany	17,183	17,252	180,001	165,545	—	Germany	(6)	2,152	481	6,742	18,689
Austria	1,133	958	10,662	10,170	—	Austria	615	624	1,504	1,493	9,345
Belgium	1,367	1,669	25,126	17,320	—	Belgium	3,029	2,218	7,696	8,605	28,024
Denmark	119	441	7,591	6,195	—	Denmark	1,702	558	3,596	1,486	6,905
Spain	1,027	1,038	22,472	18,045	—	Estonia	44	99	115	201	485
Estonia	49	40	478	366	—	Irish Free State	1,387	1,071	8,616	3,183	11,279
Irish Free State	104	31	1,786	855	—	Finland	373	608	864	1,199	2,956
Finland	49	15	220	304	—	France	4,198	3,239	11,931	7,035	36,595
France	8,327	6,462	90,205	78,895	—	Gr Brit. and N. Ir.	17,088	12,167	49,948	35,900	134,811
Gr. Brit. and N. Ir.	9,789	13,666	141,747	123,805	—	Greece	1,318	1,519	8,735	3,856	14,454
Greece	353	295	2,480	2,187	—	Italy	306	5,075	1,135	11,435	48,822
Hungary	335	322	5,432	4,760	—	Latvia	66	95	170	370	924
Italy	981	1,799	16,619	14,952	—	Norway	551	721	1,146	1,678	4,985
Latvia	88	117	1,724	2,035	—	Netherlands	1,098	2,011	4,054	6,466	20,900
Lithuania	24	55	708	553	—	Portugal	44	37	476	128	1,607
Norway	364	328	4,705	4,993	—	Sweden	284	459	681	1,204	2,939
Netherlands	8,671	8,099	147,201	117,981	—	Switzerland	(7) 1,574	(7) 1,321	(7) 3,858	(7) 3,395	(7) 11,094
Poland	1,131	1,261	12,313	11,903	—	Czechoslovakia	1,499	1,060	3,984	3,095	10,302
Sweden	622	553	9,092	8,545	—	Ceylon	60	55	141	176	597
Switzerland	825	745	23,803	16,226	—	India	(6)	(6)	(6)	(6)	3,016
Czechoslovakia	1,905	1,142	18,337	16,691	—	Indochina	42	51	143	152	671
Yugoslavia	216	110	1,473	1,724	—	Japan	948	421	1,722	677	10,964
Canada	1,905	728	15,371	17,622	—	Java and Madura	—	—	(2) 123	(2) 126	1,367
United States	13,281	16,599	406,636	431,014	—	Syria and Lebanon	(6)	15	(6)	(6)	101
Australia	1,041	710	7,308	9,273	—	Egypt	—	—	(2) 227	(2) 388	5,763
New Zealand	—	—	1,504	1,876	—	Union of South Afr.	—	—	(1) 278	(1) 287	1,938
						New Zealand	—	—	(1) 68	(1) 73	437
Totals	74,927	75,085	1,154,944	1,083,841	—	Totals	36,376	35,567	101,695	99,350	389,870

(*) Flour reduced to grain on the basis of the coefficient: 1,000 centals of flour = 1,333.33 centals of grain.

(a) Excess of exports over imports. — (b) Excess of imports over exports.

(1) Data up to 30th September — (2) Data up to 31st August. — (3) Data up to 31st March. — (4) Data up to 30th June. —

(5) See Net Imports. — (6) See Net Exports. — (7) Wheat only.

STOCKS

STOCKS AND AVAILABLE SALEABLE SUPPLIES OF CEREALS AND POTATOES IN FARMERS' HANDS

IN GERMANY, ON NOVEMBER, 15.

PRODUCTS	% Stocks total production				% Available saleable quantities: total production			
	Nov., 15 1931	Oct., 15 1931	Nov., 15 1930	Nov., 15 1929	Nov., 15 1931	Oct., 15 1931	Nov., 15 1930	Nov., 15 1929
Winter wheat	47.4	60.2	52.4	57.3	38.3	47.8	42.6	46.7
Spring wheat	74.0	80.9	74.9	80.9	61.7	68.3	59.8	66.4
Winter rye	50.5	60.7	63.4	64.8	22.3	27.4	35.1	36.6
Winter barley	34.6	41.5	34.6	49.6	6.2	7.0	4.0	11.2
Spring barley	66.2	79.6	60.3	63.7	42.0	53.0	36.4	45.5
Oats	73.4	86.6	81.4	80.1	18.7	20.1	22.5	29.4
Potatoes	65.4	80.0	68.7	67.8	19.9	28.8	23.1	20.0

Authority: Preisberichtstelle beim Deutschen Landwirtschaftsrat.

COMMERCIAL CEREALS IN STORE IN CANADA AND THE UNITED STATES.

SPECIFICATION	Friday or Saturday nearest to 1st of month					Friday or Saturday nearest to 1st of month				
	Decem., 1931	Novem., 1931	October, 1931	Decem., 1930	Decem., 1929	Decem., 1931	Novem., 1931	October, 1931	Decem., 1930	Decem., 1929
	1,000 centals					1,000 bushels				
WHEAT:										
Canadian in Canada . . .	101,453	91,718	71,470	106,200	112,670	169,088	152,863	119,117	177,000	187,734
U. S. in Canada	17,648	18,976	19,507	2,760	5,461	29,414	31,627	32,511	4,600	9,101
U. S. in the United States .	142,269	146,432	154,044	123,971	113,956	237,099	244,054	256,740	206,618	189,926
Canada in the United States .	14,087	7,558	5,470	18,178	20,716	23,479	12,596	9,116	30,297	34,527
Total . . .	275,417	264,624	250,491	251,109	252,803	459,080	441,140	417,484	418,515	421,328
RYE:										
Canadian in Canada . . .	6,833	7,292	6,891	7,157	4,529	12,202	13,021	12,306	12,780	8,685
U. S. in Canada	438	460	688	1,171	1,645	782	821	1,229	2,090	2,937
U. S. in the United States .	5,839	5,811	5,654	9,617	6,739	10,427	10,377	10,097	17,173	12,033
Canada in the United States	787	217	218	364	241	1,405	388	390	651	431
Total . . .	13,897	13,780	13,451	18,309	13,154	24,816	24,607	24,022	32,694	23,489
BARLEY:										
Canadian in Canada	4,624	5,410	5,440	14,423	12,013	9,633	11,270	11,334	30,048	25,027
U. S. in Canada	12	12	12	174	438	24	24	24	363	954
U. S. in the United States .	3,419	3,539	3,461	7,026	5,645	7,123	7,373	7,211	14,637	11,760
Canada in the United States .	312	2	40	749	1,266	649	4	84	1,561	2,637
Total . . .	8,367	8,963	8,953	22,372	19,382	17,429	18,671	18,653	46,609	40,378
OATS: (1)										
Canadian in Canada	4,616	6,734	3,233	4,706	7,139	14,426	21,044	10,122	14,704	22,310
U. S. in Canada	159	78	68	712	1,500	496	244	211	2,225	4,686
U. S. in the United States .	5,812	5,820	5,562	9,761	9,621	18,164	18,189	17,380	30,504	30,064
Canada in the United States .	10	13	13	2	214	32	41	41	7	670
Total . . .	10,597	12,645	8,882	15,181	18,474	33,118	39,518	27,754	47,440	57,730
MAIZE:										
U. S. in Canada	570	640	289	410	189	1,017	1,143	516	733	337
of other origin in Canada . .	1,280	865	295	832	1,000	2,286	1,544	527	1,436	1,787
U. S. in the United States .	5,487	4,111	3,135	4,106	1,670	9,798	7,341	5,598	7,332	2,982
Total . . .	7,337	5,616	3,719	5,348	2,859	13,101	10,028	6,641	9,561	5,106

(1) All oats expressed in bushels of 32 lbs.

QUANTITIES OF CEREALS ON OCEAN PASSAGE WITH FIRST DESTINATION FOR EUROPE.

SPECIFICATION	Saturday nearest to 1st of month					Saturday nearest to 1st of month				
	Decem., 1931	Novem., 1931	October, 1931	Decem., 1930	Decem., 1929	Decem., 1931	Novem., 1931	October, 1931	Decem., 1930	Decem., 1929
	1,000 centals					1,000 bushels				
Wheat (and flour in terms of wheat) . .	21,432	23,093	22,709	27,339	17,160	35,720	33,488	37,848	45,648	28,800
Rye	2,443	922	518	933	77	4,363	1,646	926	1,140	137
Barley	3,652	4,088	3,720	5,724	6,504	7,608	8,517	7,750	11,925	13,550
Oats	1,232	1,178	1,168	1,165	464	3,520	3,680	3,660	3,640	1,450
Maize	25,102	26,515	21,619	15,173	10,814	44,931	47,349	38,606	27,094	19,311

Authority *Broomhall's Corn Trade News*

GRAIN AND FLOUR STOCKS AT THE PORTS OF GREAT BRITAIN AND IRELAND (1).

PRODUCTS	First of the month					First of the month				
	Decem., 1931	Novem., 1931	October, 1931	Decem., 1930	Decem., 1929	Decem., 1931	Novem., 1931	October, 1931	Decem., 1930	Decem., 1929
	1000 centals					1000 bushels				
WHEAT:										
Grain	16,608	16,416	12,460	7,464	11,424	27,680	27,360	20,800	12,440	10,040
Flour as grain . .	1,104	960	768	888	912	1,840	1,000	1,280	1,480	1,520
TOTAL	17,712	17,376	13,228	8,352	12,336	29,520	28,360	22,080	13,920	20,560
Barley	1,100	1,140	720	1,460	1,496	2,292	2,375	1,500	3,042	3,117
Oats	432	672	896	1,376	1,072	1,850	2,100	2,800	4,300	3,350
Maize	3,840	2,784	1,650	2,250	4,104	6,857	4,971	3,000	4,071	7,329

Authority: *Broomhall's Corn Trade News*.

(1) Imported cereals.

STOCKS OF COTTON ON HAND IN THE UNITED STATES

LOCATION	Last day of the month					Last day of the month				
	Novem., 1931	October, 1931	Septem., 1931	Novem., 1930	Novem., 1929	Novem., 1931	October, 1931	Septem., 1931	Novem., 1930	Novem., 1929
	1000 centals					1000 bales (counting round as half bales)				
In consuming establishments	6,595	5,340	3,710	7,629	8,137	1,441	1,116	875	1,567	1,671
In public storage and at compresses . .	51,180	45,218	30,131	40,930	28,476	10,696	9,450	6,297	8,397	5,842
TOTAL	57,775	50,558	33,841	48,559	36,613	12,137	10,566	7,172	9,964	7,513

STOCKS OF COTTON AT BOMBAY AND AT ALEXANDRIA.

PORTS	Thursday nearest to 1st of month					Thursday nearest to 1st of month				
	Decem., 1931	Novem., 1931	October, 1931	Decem., 1930	Decem., 1929	Decem., 1931	Novem., 1931	October, 1931	Decem., 1930	Decem., 1929
	1000 centals					1000 bales (1 bale = 478 lbs.)				
Bombay (1)	1,498	1,772	2,144	1,597	2,582	313	371	449	334	530
Alexandria	5,557	4,807	4,103	4,829	3,134	1,163	1,006	858	1,010	656

Authorities: *East Indian Cotton Ass.* and *Bourse de Minet-el-Bassal*.

(1) Stocks held by exporters, dealers and mills.

STOCKS OF COTTON IN EUROPE.

COUNTRIES, PORTS, DESCRIPTORS	Thursday or Friday nearest to 1st of month					Thursday or Friday nearest to 1st of month				
	Decem., 1931	Novem., 1931	October, 1931	Decem., 1930	Decem., 1929	Decem., 1931	Novem., 1931	October, 1931	Decem., 1930	Decem., 1929
	1000 centals					1000 bales (1 bale = 478 lbs.)				
<i>Great Britain</i> *										
American	1,459	1,159	1,395	1,925	1,730	305	243	292	408	362
Argentine, Brazil- ian, etc.	192	168	222	221	265	40	35	46	46	55
Peruvian, etc. . .	265	278	282	429	396	56	58	50	90	83
East Indian, etc.	527	502	574	166	158	110	105	120	35	33
Egyptian, Sudan- ese	1,287	1,189	1,265	1,297	960	260	249	265	271	201
Other (1)	190	191	233	238	295	40	40	49	49	62
TOTAL	3,920	3,487	3,971	4,271	3,804	829	730	831	894	796
<i>Bremen</i>										
American	1,366	809	872	2,223	2,030	256	160	183	465	425
Other	35	50	65	42	14	7	11	13	9	3
TOTAL	1,401	859	937	2,265	2,044	263	170	196	474	428
<i>Le Havre</i> *										
American	821	815	896	1,074	859	172	170	158	225	180
Other	119	124	140	126	141	25	26	29	26	29
TOTAL	940	939	1,036	1,200	1,000	197	196	217	251	209
<i>Total Continent (2):</i>										
American	2,708	1,939	1,680	3,332	3,415	565	406	343	739	715
Argentine, Brazil- ian, etc.	57	31	97	136	65	12	17	20	39	14
E. Indian, Austral- ian, etc.	115	163	171	182	117	24	34	36	38	24
Egyptian	126	116	117	96	58	26	24	25	20	12
W. Indian, W. Afri- can, E. African, etc.	86	35	40	82	104	5	7	5	17	22
TOTAL	3,037	2,334	2,064	4,028	3,759	635	485	432	843	787

Authority: *Liverpool Cotton Ass.*

(1) Includes: W. Indian, etc.; E. African, etc.; W. African, and Australian. — (2) Includes Bremen, Havre, and other Continental ports.

IMPORT DUTIES ON CEREALS AND FLOUR

CHANGES

TO BE MADE IN THE DUTIES PUBLISHED ON PAGE 428 OF THE CROP REPORT OF JULY, 1931.

COUNTRY	PRODUCT	Date when enforced	Original data per metric quintal	Data in Amer. cents per bushel or barrel
Germany	Barley for fodder, under customs control (1) . . .	December, 1 st	R. M. 4.00	20.76
Estonia	Wheat, Rye, Barley, Oats, Maize, Bolted and un- bolted wheat flour, bolted and unbolted rye flour	November, 6	(2)	(2)
Yugoslavia	Barley	November, 16	Gold dinars 6.00	25.20

(1) In the case of controlled purchase of potato flakes from organisations designated by the Minister for Food and Agriculture. —

(2) Imported exclusively by the Monopoly.

MONTHLY REVIEW OF PRICES (1)

PRODUCTS, MARKETS AND DESCRIPTIONS	Dec	Dec	Dec.	Nov.	Nov.	Average (2)					Commercial Season	
	18,	11,	4,	27,	20,	Nov	Dec.	Dec				
	1931	1931	1931	1931	1931	1931	1930	1929	1930-31	1929-30		
WHEAT.												
Budapest (b) Tisza region (78-80 kg. p. hl.: pengó p. 100 kg.)	14 12	13 72	13 70	12 55	11 60	11 02	n. 14 45	23 50	15 34	22 94		
Braila . Home grown (79-80 kg. p. hl.; lei p. 100 kg.) . . . . .	...	295	310	300	320	207	632	647	351	612		
Winnipeg: No. 1 Manitoba (cents p. 60 lbs.)	60 3/4	59 7/8	62	60 1/4	63 3/8	66	55 1/8	136 3/8	64 1/4	124 1/8		
Chicago: No. 2 Hard Winter (3, (cents p. 60 lbs.)	56 1/2	54	57 1/4	55 1/4	58 3/8	61 3/8	n. 78 3/8	122 3/8	78	114 1/4		
Minneapolis: No. 1 Northern (cents p. 60 lbs.)	73 1/4	69 3/4	74 1/4	70 3/8	74 3/4	75 1/2	77 1/2	127 3/8	77 7/8	117 1/4		
New York: No. 2 Hard Winter (3, (cents p. 60 lbs.)	65 7/8	68 1/4	68 7/8	65	69 1/4	71 3/4	90 1/8	132 1/8	n. 91 1/8	121 7/8		
Buenos Aires (a); Barletta (80 kg. p. hectol. — pesos paper per quintal)	6 50	6 55	6 75	7 00	7 60	7 49	6 49	11 14	6 88	10 65		
Karachi: Karachi white, 2 1/2 % barley, 1 1/2 % dirt (rupees per 656 lbs.)	24-4-0	22-10-0	22-0-0	22-11-0	22-11-0	22-8-0	17-5-6	40-6-0	19-15-2	36-6-0		
Berlin . Home grown (Reichsmarks p. quintal)	21 00	21 00	21 80	22 25	22 65	22 55	24 70	24 17	26 00	25 38		
Hamburg, c. i. f. (Reichsmarks p. quintal):												
No. 3 Manitoba	(4) 9 94	(4) 9 86	(4) 10 28	(4) 10 54	(4) 11 39	(4) 11 43	(4) 11 73	23 50	—	21 30		
No. 2 Hardwinter	(5) 9 86	9 52	9 86	10 11	11 13	11 18	n q.	21 38	n.	13 00		
Barusso (79 kg p. hectol.)	8 45	8 16	8 58	8 54	9 47	9 67	11 44	20 78	11 22	18 72		
Antwerp (Belgian francs p. quintal):												
Home grown	78	75	78	n q.	n q.	n q.	81 3/4	157 1/2	95 1/2	154 3/4		
No. 2 Hard Winter, Gulf	(5) 80	(5) 84	(5) 86	(5) 93	(5) 97	(5) 94 1/4	105 3/4	155 1/2	112 1/2	171		
Paris: Home grown, 75-77 kg. (francs p. quintal)	162 25	161 00	162 00	158 00	161 50	161 50	167 10	190 05	175 00	139 40		
London . Home grown (shillings per 504 lbs.)	28 -	28/6	29/6	29/6	30/6	30/1	28/5	43/3	27/1	40/10		
London and Liverpool c. i. f., shipping current month (shillings p. 480 lbs.):												
South Russian (on sample)	(6) 25 -	(6) 24/9	(6) 26 3	(6) 25 -	(6) 27 -	(6) 27 2	21/7	n q.	23/7	n q.		
No. 3 Manitoba	27 -	28 9	29 1/2	27 6	28 9	29 1/2	24/1	40/7	25/4	45/2		
No. 2 Hard Winter (3,	26 10 1/2	27 27 1/2	(7) 28 -	(7) 25 9	(7) 27 9	(7) 27 11	n q.	45 1	26/4	41/5		
White Pacific	n q	n q	n q	8 n 33/-	(8) 33/6	(8) 34/2	27 -	47/5	20/7	42/3		
Rosafé (63 1/4 lbs.) afloat	25/6	25 6 (9)	26/3 (9)	(9) 24 0	(9) 26/6	(9) 26/10	22/1	43/7	23/5	40/8		
Choice White Karachi	n q.	n q.	n q.	n q.	n q.	n 32 -	25/1	n q.	27 -	42/2		
Australian	25/3	(10) 28/6	(10) 28/9	(10) 28 -	(10) 29/6	(10) 29/5	26/7	43/6	25/7	43/6		
Milan (b): Home grown, soft (liras p. quintal)	104 50	100 50	100 50	99 50	99 50	100 00	103 00	138 30	109 10	131 30		
Genoa c. i. f. (shillings p. metric ton): La Plata	n q.	n q.	n q	n q.	n q.	n q.	n. 110/-	206/6	110/-	184/6		
RYE.												
Budapest (b): Home grown (pengó p. 100 kg.)	14 80	14 72	14 65	12 52	12 10	12 16	n. 8 87	15 23	10 79	13 44		
Berlin: Home grown (Reichsmarks per quinta)	18 95	18 55	19 65	19 70	20 00	19 77	15 49	16 99	17 23	17 04		
Hamburg c. i. f.: La Plata, 74-75 kg. (R. M. p. 100 kg.)	8 33	7 90	8 67	8 67	9 60	9 32	n q.	16 21	n.	7 66		
Minneapolis: No. 2 (cents per 56 lbs.)	47	44 1/2	48	45 1/2	49 3/4	44 1/2	47 1/4	97 1/4	42 1/4	80 1/4		
Groningen (c): Home grown (florins per quintal)	4 52	4 50	4 80	5 00	5 25	5 24	4 67	7 25	4 45	6 33		
BARLEY.												
Braila: Home grown (62-63 kg p. hl., lei p. 100 kg.)	285	290	285	290	287	205	340	232	304			
Winnipeg: No. 4 Western (cents p. 48 lbs.)	37 1/2	34 3/4	36 3/8	38	41 1/4	40 1/4	22 3/4	56 1/2	26 1/4	51 1/4		
Chicago: Feeding (cents per 48 lbs.)	48	44	46	44	45	44 1/4	46 1/4	62 1/4	43 7/8	57 3/4		
Berlin: Home grown fodder (Reichsmarks per quintal)	15 10	14 85	15 50	15 85	16 45	16 01	19 16	17 20	19 52	17 40		
Antwerp: Danube (francs per quintal)	77 1/2	80	81	83	81	81 1/2	68	122 1/2	79 1/4	107 1/2		
London: English malting (shillings p. 448 pounds)	49/-	40/-	42/-	42/-	42/-	42/-	37/10	45/-	35/8	39/-		
London and Liverpool, c. i. f., parcels (shillings per 400 lbs.):												
Danubian 3 %	n q.	n q.	n q.	n q.	23/9	23/11	14/8	29/4	15/2	22/8		
Russian (Azoff-Black sea)	22/-	21/6	n q.	21/-	22/-	22/11	13/0	23/10	14/8	18/11		
Canadian Western, No. 3 (11)	24/9	24/9	26/9	25/-	23/6	24/-	15/9	28/5	15/11	27/-		
Californian malting (shillings p. 448 lbs.)	41/-	41/-	41/-	40/-	40/-	39/6	25/6	35/4	27/8	32/6		
Groningen (c): Home grown winter (fl. p. quintal)	5 77	5 70	5 82	6 07	6 12	6 16	4 74	8 80	4 97	7 55		

(a) Thursday prices — (b) Saturday prices. — (c) Prices of preceding Tuesday.

(1) All quotations are, unless otherwise stated, for spots — (2) The monthly averages are based on Friday quotations, the annual averages on the monthly — (3) Quoted formerly as No. 2 Winter — (4) No. 2 Manitoba. — (5) No. 1 Hard Winter. — (6) Russian Winter, on sample. — (7) Hard Winter on sample. — (8) Shipping December. — (9) 63 lbs. per bushel. — (10) West Australian, shipping December-January. — (11) Instead of No. 4 Western.

PRODUCTS, MARKETS AND DESCRIPTION	Dec.	Dec.	Dec.	Nov.	Nov.	Average (1)			
	18,	11,	1,	27,	20,	Nov.	Dec.	Dec.	Commercial
	1931	1931	1931	1931	1931	1931	1930	1929	Season
									1930-31 1929-30
OATS.									
Braila Home grown (43-44 kg. p. hl., lei p. 100 kg.)	..	350	350	320	320	322	187	277	247 256
Winnipeg: No. 2 White (cents per 34 lbs.)	30 1/8	30 1/4	31	29 1/2	32 1/2	32 7/8	26 1/8	62 1/2	30 58 1/2
Chicago: No. 2 White (cents per 32 lbs.)	26	25 1/2	25	25 3/4	27 1/2	27 1/8	34 1/8	46 1/4	32 7/8 44 1/8
Buenos Aires (a): Current quality (pesos paper per quintal)	4 75	5 65	5 25	5 90	6 10	6 87	3 17	5 72	3.58 5.30
Berlin: Home grown (Reichsmarks per quintal)	13 70	13 50	14 15	14 60	14 95	14 02	14 26	15.30	16.17 15.62
Paris: Home grown, black and other (francs per quintal)	93 50	92 00	81 00	93 25	93 25	92 40	73 70	57 25	81.00 81 15
London: Home grown white (shillings per 336 lbs.)	20 6	20 6	20 6	20 6	21 6	21 3	17 6	22 9	18 4 21/-
London and Liverpool: c. i. f. parcels (shillings p. 320 lbs.):									
Danubian (39-40 lbs.)	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	12/1 (s)n 16/4
Plate (f. a. q.)	16/-	16 6	17/-	16 6	17/-	17 5	10 1	17 6	10/9 16/1
Chilian Tawny	19/-	19 3	19 3	19 6	19 6	19 6	n. 12/-	20 7	12/- 17/3
Milan (b): spot (liras per quintal):									
Home grown	76 50	73 50	73 50	73 50	73 50	73 50	74.00	56 20	73.95 80.75
Foreign imported	68 00	68.00	68 00	69 00	69 00	69 00	55.75	79 35	60.40 74.30
MAIZE.									
Braila: Danube (lei per quintal)	166	152	154	157	162	163	214	316	210 309
Chicago: No. 2 Mixed American (cents per 56 lbs.)	30 1/4	36 1/2	30	40 1/4	44	43 1/8	70 1/8	90 2/8	58 1/4 55 1/8
Buenos Aires (a): Yellow Plate (pesos paper per quintal)	4 47	4 05	4 50	4 52	4 05	4 82	3 45	6 05	3 82 6 17
Antwerp, spot (Belgian francs per quintal):									
Bessarabian	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	73	n. q.	71 1/4 n. 97 1/4
Cinquantino	55 1/2	57 1/2	59	64 1/2	67	67	101 1/4	150 1/2	81 121 1/4
Yellow Plate	50	51 1/2	53 1/2	58	60	61 1/4	73	122	65 119 1/4
London and Liverpool, parcels, c. i. f. (shillings per 480 lbs.):									
Danube	(3)18/-	(3)19/-	n. q.	(3)19/-	n. q.	(3)19 9	n. 18 11	20 3	n. 17 4 24/11
Yellow Plate	17 6	16 7 1/2	16 6	15 9	17/-	17 4	10 10	28 9	15 6 25/3
No. 2 White African	(4)22/-	20 6	21 3	21 3	21 6	21 8	n. q.	30 11	n. 18 11 26/-
Milan (b): Home grown (liras per quintal)	62 50	61 50	60 50	60 50	61 50	61.25	50.25	80 35	51.90 71.35
RICE (CLEANED).									
									1930 1929
Milan (b): Maratelli (lire per quintal)	131 00	131 00	140 00	140 00	140 00	140 00	111 00	175 50	152.15 195.70
Rangoon: No. 2 Burma (rupces per 7500 lbs.)	260	265	265	260	255	266	260	425	303 1/4 462 1/4
Saigon (Indochinese piastres p. quintal):									
No. 1 Round white (25 % broken)	6 26	6 10	6 01	6 34	6 43	6 60	5 56	12 18	11.38 11.58
No. 2 Japan (40 % broken)	5 68	5 60	5 52	5 81	6 01	6 15	5 08	11 51	10.89 11.08
London (a): c. i. f. (shillings per 112 lbs.):									
Spanish Belloch, No. 3 oiled	13 11 1/2	13 6	13 10 1/2	12 9	12 4 1/2	12 9	12 4	16 10	14 1 17 1/11
Italian good, No. 6 oiled	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	12 3	16 8	14 1/11 18 9
American Blue Rose	22/-	22 6	23/-	21-	20 6	20 4	18 3	21 3	21 9 21 10
Burma, No. 2	8 9	9/-	9/-	8 9	8 10 1/2	8 8	8 2 1/2	12 5	10 1/11 13 2
Saigon, No. 1	9 9	9 10 1/2	9 9	9 3	9 3	9 6	9/-	12 3	11 6 13 3
Siam, Garden, No. 1	n. q.	n. q.	n. q.	n. q.	n. q.	11 3	10-	14 5	14/- 15 1
Tokio: Various qualities (yens per koku)	19 60	18 10	18 00	17 50	17 60	17 55	18 00	27 75	25.57 29 06
LINSEED.									
Buenos Aires (a): Current quality (pesos paper per quintal)	9 80	9 90	10 10	9 70	11 70	11 00	11 45	20 09	17 19 18 20
Antwerp: Plate (Belgian francs p. quintal)	108	113	112	124	131	129 1/4	260	374	284 1/4 318 1/4
Hull, c. i. f.: Plate (p. sterling p. l. ton)	9-2-6	9-3-9	9-7-6	9-0-0	9-5-0	9-10-0	9-7-2	10-14-1	15-0-5 18-5-0
London, c. i. f.: Bombay bold (p. st. per long ton)	11-10-0	11-10-0	11-15-0	11-5-0	11-12-6	11-16-10	13-0-7	23-1-10	17-14-4 20-16-1
Duluth: No. 1, Northern (cents p. 56 lbs.)	141 1/4	137 1/4	140 1/4	137 1/4	142 1/4	(5)141 1/4	159 1/4	315 1/2	236 273 1/4

(a) Thursday prices — (b) Saturday prices.

(1) The monthly averages are based on Friday quotations, the annual averages on the monthly. — (2) Weight not indicated. — (3) Dan., Galatz-Foxonian. — (4) Shipping January. — (5) November, 13: 142 1/4.

PRODUCTS, MARKETS AND DESCRIPTION	Average (1)									
	Dec 18, 1931	Dec. 11, 1931	Dec 4, 1931	Nov. 27, 1931	Nov. 20, 1931	Nov 13, 1931	Dec. 6, 1930	Dec 1929	Commercial Season	
									1930-31	1929-30
COTTONSEED										
Alexandria: Sakellariadis (piastres per ardeb)	56.0	57.8	58.2	57.3	62.3	62.8	53.0	57.3	52.2	67.9
Hull. Sakellariadis (p. steri per long ton)	5-17-6	6-2-6	5-18-0	6-0-0	6-10-0	6-10-7	5-14-4	8-0-0	5-12-6	6-18-2
COTTON.										
New Orleans: Middling (cents per lb.)				5.99	6.04	6.28	9.60	17.02	10.07	16.17
New York: Middling (cents per lb.)				6.15	6.20	6.41	9.96	17.29	10.38	16.60
Bombay: M. g. Broach f. g. (rupees per 784 lbs.)	194	194	192	183	181	186	177 1/4	315 1/2	191 1/4	233 1/2
Alexandria (a) (talariis per kantar):										
Sakellariadis f. g. f.	12.87	13.22	12.77	13.02	13.17	13.17	14 1/8	28 7/8	17.12	28 1/8
Ashmoun (Upper Egypt) f. g. f.	9.75	10.20	9.65	9.30	9.25	9.59	10 1/4	19 1/8	12.00	19 1/8
Bremen: Middling (U. S. cents per lb.)	7.24	7.14	7.30	7.31	7.45	7.55	11.13	18.01	11.59	18.27
M. g. Broach fully good (pence per lb.)	n. 5.10 n.	5.10 n.	4.90 n.	4.60 n.	4.60 n.	4.50 n.	4.47 n.	7.62 n.	4.63 n.	6.83
Le Havre: Middling, Gulf (francs per 50 kilogr.)				202	211	212	335	568	349	545
Liverpool (pence per lb.):										
Middling fair	n. 6.20 n.	6.31 n.	6.29 n.	6.05 n.	6.04 n.	6.13 n.	6.63 n.	10.75 n.	6.93 n.	10.39
Middling	5.30	5.21	5.14	4.00	4.89	4.97	5.44	9.48	5.72	9.09
Sao Paulo, good fair	5.30	5.31	5.29	5.06	5.04	5.13	5.73	9.63	5.91	9.02
M. g. Broach, fully good	n. 4.72 n.	4.85 n.	4.65 n.	4.39 n.	4.39 n.	4.54 n.	4.00 n.	7.40 n.	4.25 n.	6.80
Sakellariadis, fully good fair	7.20	7.30	7.20	7.15	7.40	7.42	8.07	14.24	9.08	14.52
BUTTER.										
									1930	1929
Copenhagen (a) (Kr. p. 100 kg.) . . . . .	..	228	218	210	210	209	223	295	245	308
Maastricht, auction (b): Dutch (florins p. kg.) . . . . .	...	1.14	1.12	1.16	1.18	1.18	1.38	2.13	1.70	2.09
Hamburg, auction (b): Schleswig-Holstein butter, with quality mark (R. M. per 50 kg.)		115.79	115.45	116.84	123.15	120.45	144.01	176.90	146.67	178.08
Kempten (b): Allgäu butter (Pfennige p. half kg.)	97	97	97	97	102	101	122 1/2	159	128	159
London (c) (shillings p. cwt.):										
British blended	135/4	135/4	135/4	140/-	140/-	140/-	133/4	106/-	158/8	196/-
Danish	140/-	136/-	130/-	132/-	130/-	135/8	140/-	136/8	153/6	180/6
Irish creamery, salted	n q.	118/-	118/-	119/-	120/-	121.9	n q.	180/8	134/10	170/4
Dutch	146/-	137/-	137/-	138/-	137/9	141/-	190/8	161/11	182/4	182/4
Argentine	106/-	108/-	108/-	113/-	115/-	116/-	114/1	172/-	135/10	174/1
Siberian	(2) 94/- (2) 94/-	(2) 95/6 (2) 95/6	(2) 93/- (2) 93/-	(2) 92/6 (2) 92/6	(3) 94/7 (3) 94/7	106/-	167/4	131/6	167/2	167/2
Australian, salted	112/-	114/-	113/-	114/-	116/-	117/-	113/7	171/4	135/9	176/-
New Zealand, salted	113/-	116/-	116/-	118/-	122/-	122/6	115/1	170/7	137/8	178/9
CHEESE.										
Milan (lire per quintal):										
Parmigiano-Reggiano, 1st quality of last year's production	975	975	975	975	975	975	1,100	1,137	1,180	1,074
Green Gorgonzola, mature, choice	545	550	555	560	585	586	694	821	671	829
Rome: Roman pecorino, choice (lire p. quintal)	1,175	1,175	1,175	1,175	1,175	1,175	1,115	1,352	1,207	1,546
Alkmaar: Edam 40 + 40% butterfat, with the country's cheesemark, factory cheese, small; florins, p. 50 kg.) . . . . .	..	23.00	21.00	24.00	23.00	27.37	35.87	49.25	40.83	47.10
Gouda (4): Gouda 45 + (whole milk cheese, with the country's cheesemark, home made; florins, p. 50 kg.) . . . . .	..	31.00	34.00	38.00	36.50	36.25	40.25	56.37	45.56	52.45
Kempten (b): (Pfennige per half kg.):										
Softcheese, green (20 % butterfat)	25	25	25	25	25	25	28 1/2	33 1/2	27	35
Emmenthal from the Allgäu (whole milk cheese) 1st quality	90 1/2	90 1/2	90 1/2	93 1/2	93 1/2	94 1/4 (5) 91	5) 101 1/2 (5)	97	(5) 107	
London (c) (shillings per cwt.):										
English Cheddar	106/-	102/-	102/-	100/-	98/-	95/8	95/10	108/-	103/4	121/9
Canadian	73/-	72/-	72/-	72/-	73/-	72/9	81/-	102/10	98/11	107/8
New Zealand	68/-	69/6	70/6	70/6	71/6	71/3	65/8	95/-	82/2	95/5
Liverpool (c): Engl. Cheshire, ungraded (sh. p. cwt.)	142/4	137/8	133/-	128/4	123/8	119/-	91/7	135/4	96/5	111/9

(a) Thursday prices. — (b) Wednesday prices. — (c) Average prices for weeks ending on preceding Wednesday

(1) The monthly averages are based on Friday quotations, the annual averages on the monthly. — (2) Price for the indicated Friday and preceding Thursday. — (3) Average calculated from the prices for the Fridays and the Thursdays which precede. — (4) Indicated formerly as Bodegraven. — (5) Average price for all qualities

THE PRICES OF AGRICULTURAL PRODUCTS IN NOVEMBER 1931

In the following pages the index-numbers of prices of agricultural products and other price indices of interest to the farmer are given as published in the different countries. The indices collected together have been obtained according to different methods and criteria in the various countries. A detailed account of the items included in each series and the system of construction of the index-numbers may be found in the volume published especially for this purpose by the Institute, entitled « Index-numbers of prices of agricultural products and other price indices of interest to the farmer ». We refer the reader to this volume for an exact interpretation of the significance of the different series of data.

Owing to the substantial divergence which often exists in the value and significance of the indices available, much care is advisable in their utilization from an international point of view. For this reason it has been considered opportune to reproduce all the data in their original form only, without attempting to formally unite them. The latter process, by a comparison of often heterogeneous data, might easily lead to the drawing of erroneous relations and conclusions.

But in addition to the original data, and subject to the above comments, a summary tables is given below.

COUNTRIES	Percentage variations in the index-numbers for November, 1931			
	compared with those for October, 1931		compared with those for November, 1930	
	Index-numbers of prices of agricultura products	General index-numbers of prices	Index-numbers of prices of agricultural products	General index-numbers of prices
Germany	— 0.0	— 0.5	— 12.1	— 11.2
England and Wales	— 0.9	—	— 13.2	—
Argentina . . .	+ 1.9	—	— 1.0	—
Canada	— 2.4	— 0.3	— 16.2	— 11.5
Estonia	—	—	—	—
United States . . a)	+ 4.4	—	— 31.1	—
b)	— 0.2	— 0.1	— 26.0	— 15.0
Finland	— 7.5	— 6.1	— 2.7	— 0.0
Hungary	+ 1.1	— 2.1	— 11.2	+ 7.6
Italy	— 0.1	— 0.3	— 9.9	— 13.3
New Zealand . . .	— 3.4	—	— 8.9	—
Netherlands . . .	— 0.0	— 0.0	— 20.5	— 19.1
Poland	+ 3.4	— 2.9	— 8.9	— 13.2
Yugoslavia c)	— 0.3	— 1.3	c) — 0.7	—
d)	— 3.8	—	d) — 33.1	— 13.4

a) "Bureau of Agricultural Economics". — b) "Bureau of Labor". — c) Products of the soil. — d) Animal products.

INDEX-NUMBERS OF PRICES OF AGRICULTURAL PRODUCTS AND OF COMMODITIES BOUGHT BY THE FARMER *

COUNTRIES AND CLASSIFICATION	Nov.	October	Sept.	August	July	June	Nov.	Nov.	Year	
	1931	1931	1931	1931	1931	1931	1930	1929	1930 (1)	1929
GERMANY										
(Statistisches Reichsamt)										
1913 = 100										
Foodstuffs of vegetable origin	115.6	112.5	111.7	114.6	126.1	129.8	110.9	119.1	115.3	126.3
Livestock	71.4	76.9	84.7	89.0	81.7	81.5	108.2	128.2	112.4	126.0
Livestock products	107.4	106.7	108.4	107.9	105.6	103.3	131.3	153.3	121.7	142.1
Feeding stuffs	98.7	95.5	96.8	98.3	104.7	114.5	87.9	106.5	98.2	125.9
<i>Total agricultural products</i>	98.5	98.5	101.1	103.4	105.4	107.3	112.0	128.4	113.1	136.2
Fertilizers	72.3	74.0	73.6	72.8	71.3	77.9	80.4	82.8	82.4	84.5
Agricultural dead stock	128.6	129.5	129.7	123.9	129.9	130.0	137.4	141.1	139.4	141.3
<i>General index-number</i>	106.6	107.1	108.6	110.2	111.7	112.3	120.1	135.5	124.6	137.2
ENGLAND AND WALES										
(Ministry of Agriculture)										
Average of corresponding months										
1911-13 = 100										
<i>Agricultural products</i>	112	113	120	121	121	123	129	144	134	144
Feeding stuffs	86	83	76	77	81	82	78	125	96	139
Fertilizers	90	80	88	95	100	100	100	99	101	100
<i>General index-number (2)</i>		96.8	94.9	98.1	94.4	97.2	104.2	127.4	114.1	135.3
ARGENTINA										
(Banco de la Nación argentina)										
1926 = 100										
Cereals and linseed	65.6	63.3	52.7	53.7	55.1	54.5	59.8	100.5	82.3	100.4
Meat	84.8	83.3	97.1	96.4	92.5	93.8	99.3	116.6	110.9	113.6
Hides and skins	66.3	61.5	53.4	59.3	63.1	64.1	70.4	79.7	71.6	95.0
Wool	53.0	60.3	54.3	55.8	52.4	54.8	57.3	95.1	67.4	103.5
Dairy products	70.7	74.2	75.8	84.8	84.0	74.6	72.6	103.8	82.4	105.9
Forest products	81.7	83.5	89.5	91.6	107.1	108.7	103.7	111.8	107.9	111.5
<i>Total agricultural products</i>	68.6	67.3	60.9	62.2	62.9	62.8	67.9	101.5	85.5	102.6
CANADA										
(Internal Trade Branch										
of the Dominion Bureau of Statistics)										
1926 = 100.										
Field products (grain, etc.)	46.0	44.0	41.1	43.0	44.8	47.3	43.7	94.3	70.0	93.8
Animals and animal products	72.1	72.1	72.5	74.3	73.2	73.1	96.6	113.6	102.9	112.5
<i>Total Canadian farm products</i>	55.8	54.5	52.8	54.7	55.4	56.9	66.6	101.5	82.3	100.8
Fertilizers	75.5	75.5	74.8	86.8	86.9	86.9	89.3	80.8	88.2	92.6
<i>General index-number</i>	70.6	70.4	70.0	70.9	71.7	72.2	79.8	95.7	86.6	95.6
ESTONIA										
(Central Bureau of Statistics)										
1922 = 100										
Commodities imported		86	87	91	92	93	88	87	79	95
Commodities exported		57	60	63	62	64	72	100	83	113
<i>Agricultural products imported and exported</i>		66	69	72	71	73	74	101	82	106

* For an explanation of the method of calculation of the index-numbers, reference should be made to the Institute's publication "Index-numbers of Prices of Agricultural Products and other Price-indices of interest to the Farmer" (Rome, 1930).
(1) Some data are provisional. — (2) Calculated by the "Statist", reduced to base-year 1913 = 100.

COUNTRIES AND CLASSIFICATION	Nov	October	Sept.	August	July	June	Nov	Nov.	Year	
	1931	1931	1931	1931	1931	1931	1930	1929	1930	1929
UNITED STATES (Bureau of Agricultural Economics) Average 1909-10 to 1913-14 = 100.										
Cereals	57	46	50	54	57	67	80	118	100	121
Fruits and vegetables	68	70	83	97	110	114	114	159	158	136
Meat animals	76	79	86	92	92	91	118	144	134	156
Dairy products	95	95	92	87	85	86	124	142	123	140
Poultry and poultry products	123	110	99	93	83	81	146	200	126	159
Cotton and cottonseed	50	42	47	53	71	65	80	132	102	145
Total agricultural products	71	68	72	75	79	80	103	136	117	138
Commodities purchased by farmers (1)	123	126	127	127	129	130	142	154	146	155
Agricultural wages (1)	—	—	113	—	—	123	(2) 150	(3) 174	152	170
UNITED STATES (Bureau of Labor) 1926 = 100.										
Grains	51.3	44.3	44.2	44.8	49.0	56.0	64.0	94.9	58.3	97.4
Livestock and poultry	55.7	57.6	61.0	67.0	63.0	61.9	77.7	93.7	89.2	106.1
Other farm products	63.1	64.2	65.4	67.3	71.3	70.8	85.4	108.1	91.1	106.6
Total farm products	58.7	58.8	60.5	63.5	64.9	65.4	79.3	101.1	88.3	104.9
Agricultural implements	92.1	92.3	94.5	94.5	94.5	94.6	94.9	96.1	95.1	97.9
Fertilizer materials	70.1	70.2	74.2	74.4	78.7	79.8	82.1	89.9	85.6	92.1
Mixed fertilizers	77.7	77.2	77.6	78.7	80.2	82.4	91.1	97.4	93.6	97.2
Cattle feed	59.8	49.4	44.4	50.8	55.8	61.1	83.0	124.1	99.7	121.6
Non-agricultural commodities	71.0	71.2	71.7	72.1	71.5	71.4	80.9	92.6	85.9	94.4
General index-number	68.3	68.4	69.1	70.2	70.0	70.0	80.4	94.4	86.3	96.5
FINLAND (Central Bureau of Statistics) 1926 = 100										
Cereals	81	73	70	76	79	73	71	81	76	98
Potatoes	49	49	50	84	101	78	51	84	76	143
Fodder	62	53	52	60	65	65	58	67	62	69
Meat	51	54	59	64	65	68	70	94	83	103
Dairy products	83	77	72	72	70	70	70	110	84	103
Total agricultural products	72	67	66	70	71	70	74	94	82	100
General index-number	87	82	79	81	82	83	87	95	90	98
HUNGARY (Central Bureau of Statistics) 1913 = 100.										
Agricultural and livestock products	89	88	88	83	87	82	80	97	—	—
General index-number	99	97	96	92	95	91	92	107	—	—
ITALY (Consiglio Provinciale dell'Economia Corporativa di Milano) 1913 = 100.										
National agricultural products	330.84	337.20	334.23	330.21	337.05	348.32	373.77	470.61	413.39	508.76
General index-number	328.74	329.85	330.33	331.42	337.43	339.33	379.03	464.23	411.04	480.60
NEW ZEALAND (Census and Statistics Office) Average 1909-13 = 100.										
Dairy produce	102.6	108.9	102.9	103.7	96.7	88.8	104.8	141.7	120.7	145.7
Meat	113.1	119.6	120.7	127.9	126.0	125.7	146.5	157.8	164.7	178.9
Wool	68.2	61.6	63.0	68.9	73.2	74.2	79.8	134.9	100.7	170.9
Hides, skins, and tallow	67.9	60.0	79.8	82.1	83.4	86.2	98.9	156.2	145.4	188.6
Miscellaneous	93.1	122.1	109.8	93.9	122.1	129.2	126.0	152.3	134.0	146.7
Total agricultural products	97.8	101.2	99.7	100.5	100.1	96.3	107.4	142.8	126.7	161.3

(1) 1910-14 = 100. — (2) October.

COUNTRIES AND CLASSIFICATION	Nov	October	Sept.	August	July	June	Nov	Nov	Year	
	1931	1931	1931	1931	1931	1931	1930	1929	1930 (1)	1929
NORWAY (Kgl. Selskap for Norges Vel) Average 1909-14 = 100.										
Cereals	110	106	111	112	111	108	101	143	(2) 114	(2) 155
Potatoes	119	109	97	170	237	165	155	104	(2) 152	(2) 120
Pork	88	92	86	91	83	76	102	143	(2) 98	(2) 141
Other meat	121	127	187	158	160	153	192	191	(2) 188	(2) 189
Eggs	132	126	117	87	81	77	179	199	(2) 121	(2) 135
Dairy products	133	181	127	126	125	126	158	175	(2) 150	(2) 161
Concentrated feeding stuffs	102	97	97	102	103	105	115	147	(2) 117	(2) 148
Maize	81	73	71	79	81	87	97	144	(2) 103	(2) 148
Fertilizers	86	81	81	85	96	96	101	102	(2) 101	(2) 108
NETHERLANDS (Directie van den Landbouw) Average 1924-25 to 1928-29 = 100.										
Products of the soil	59	58	57	61	67	71	61	68	(3) 67	(3) 68
Animal products	57	58	64	68	70	71	77	97	(3) 77	(3) 95
Total agricultural products	58	58	62	67	69	71	73	90	(3) 75	(3) 88
Agricultural wages	95	95	95	95	95	95	100	100	(3) 99	(3) 100
General index-number (4)	60.2	60.2	61.6	63.7	65.6	67.7	74.4	92.7	79.2	96.1
POLAND (Central Bureau of Statistics) 1927 = 100.										
Products of the soil	59.1	51.0	46.6	47.7	43.2	63.8	47.6	68.1	52.1	78.1
Products of agricultural industry	68.7	61.8	60.1	62.1	64.1	72.9	63.4	78.8	69.9	80.9
Total products of plant origin	64.2	56.6	53.3	54.8	56.0	65.1	56.1	72.2	60.5	79.9
Animals	43.7	47.5	59.3	66.2	67.0	90.5	72.7	101.2	82.4	88.4
Dairy products	78.9	66.3	63.3	61.2	59.2	57.5	67.0	111.1	81.5	102.9
Total products of animal origin	56.4	55.3	6.3	64.2	63.6	59.3	84.0	105.5	81.9	100.2
Total agricultural products	60.3	55.6	56.2	58.3	58.8	63.8	66.2	84.5	68.5	85.7
Fertilizers	118.5	118.5	118.5	118.5	118.5	118.5	124.7	130.6	127.8	126.6
Industrial products	74.5	75.3	76.0	77.8	80.1	80.8	88.9	102.0	94.0	103.8
General index-number	68.2	66.3	67.0	69.0	70.3	73.2	78.6	94.6	82.3	95.7
YUGOSLAVIA (National Bank of the Kingdom of Yugoslavia) 1926 = 100.										
Products of the soil	70.9	71.1	70.4	75.7	78.9	77.8	71.4	106.0	89.3	118.6
Animal products	63.6	63.1	70.6	75.6	74.7	71.7	95.1	99.2	96.3	107.2
Industrial products	68.7	69.3	72.2	70.8	71.3	71.7	74.8	89.3	81.8	92.6
General index-number	68.6	69.5	71.6	73.6	74.4	73.8	79.2	95.3	86.6	100.6

(1) Some data are provisional. — (2) Agricultural year April 1-March 31. — (3) Agricultural year July 1-June 30. — (4) Calculated by the Central Statistical Bureau of the Netherlands, reduced to the base 1925-1929 = 100.

RATES OF FREIGHT

(Rates for full cargoes)

VOYAGES	Dec	Dec	Dec.	Nov.	Nov.	Average				Commercial Season
	18,	11,	4,	27,	20,	Nov.	Dec.	Dec.		
	1931	1931	1931	1931	1931	1931	1930	1929		
SHIPMENTS OF WHEAT AND MAIZE.										
									1930-31	1929-30
Danube to Antwerp/Hamburg (shill. er	15/3	15/6	15/3	15/6	15/6	15/4½	14/7	17/-	13/11	15/8
Black Sea to Antwerp/Hamburg (2240 lbs.)	11/-	11/3	10/9	11/-	11/3	11/6	10/10½	n. q.	10/10	n. q.
St. John to Liverpool (1)	1/9	1/9	1/9	n. q.	n. q.	n. q.	1/6	1/6	1/6	1/5
Montreal to United Kingdom	n. q.	n. q.	n. q.	2/9	2/9	2/7½	n. q.	n. q.	1/10	1/10
Gulf to United Kingdom (shill. per	(1) 2/9	(1) 2/9	(1) 2/9	(1) 2/9	(1) 2/9	(1) 2/10	(1) 2/2	2/6	2/3	2/6
New York to Liverpool (1) (480 lbs.)	1/6	1/6	2/-	2/-	2/-	2/1½	1/6	1/9	1/6	1/6
Northern Range to U.K. and Continent	n. q.	n. q.	n. q.	n. 2/-	n. 2/-	n. 2/3	1/7½	1/10	1/9	1/9
North Pacific to United Kingdom (sh. per 2240 lbs.) (2)	n. 23/-	23/6	n. 23/-	n. 23/-	n. 23/-	u. 23/8	23/-	24/5	22/3	22/7
Vancouver to Yokohama (1) (Canad. \$ p. sh. ton).	2.25	2.25	2.25	2.85	2.85	2.30	2.50	3.00	2.72	2/5
La Plata Down River (3) to U. K./Continent										
La Plata Up River (4) to U. K./Continent	16/6	15/-	14/6	15/-	15/6	16/-	17/4½	12/10	16/4	12/8
La Plata Down River (3) to U. K./Continent	18/-	17/6	16/-	16/6	17/-	17/6	19/11½	14/4	18/-	14/4
Karachi to U. K./Continent (5)	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	10/9	n. q.	10/3	n 15/4
Western Australia to U.K./Continent.	20/6	20/-	20/-	20/6	20/6	20/11½	20/4½	24/11	20/8	25/7
SHIPMENTS OF RICE.										
									1930	1929
Saigon to Europe (shill. per	(1) 26/3	(1) 26/3	(1) 23/0	(1) 23/0	(1) 23/9	(1) 23/3	(1) 19/-	(1) 26/-	n. 18/11	n. 26/1
Burma to U.K./Continent (2240 lbs.)	26/-	n. q.	26/3	25/-	25/-	24/5	n. 19/3	n. q.	17/8	n. q.

(1) Rates for parcels by liners — (2) The demand for cargoes for Europe has recently been greatly reduced due to the numerous shippings to Shanghai (freight rate Portland/Puget Sound-Shanghai: Amer \$ 2.85) — (3) "Down River", includes the ports Buenos Aires and La Plata. — (4) "Up River", includes the ports on the Paraná River as far as San Lorenzo. Cargoes from ports beyond San Lorenzo (Colastine, Santa-Fe and Paraná) are subject to an extra rate of freight — (5) The original data being quoted in "scale terms", 10 % is added to arrive at freights per 2,240 lbs.

EXCHANGE RATES

PERCENTAGE OF PREMIUM (+) OR OF LOSS (—) OF DIFFERENT CURRENCIES IN RESPECT OF THEIR PARITY WITH THE DOLLAR (1).

COUNTRY	Exchange	December 18, 1931	December 11, 1931	December 4, 1931	November 27, 1931	November 20, 1931
Germany	Berlin	—	0.4	—	0.4	—
Argentina	New York	—	39.3	—	39.2	—
Belgium	Brussels	+	0.3	—	0.2	—
Canada	New York	—	18.9	+	0.2	—
Denmark	Copenhagen	—	30.5	—	17.1	—
Egypt	London	—	30.5	—	31.4	—
France	Paris	+	0.4	—	31.5	—
Great Britain	London	—	22.7	+	0.0	—
Hungary	Budapest	—	0.0	—	31.5	—
India	London	—	22.0	—	0.1	—
Indo-China	Paris	+	0.4	—	31.2	—
Italy	Milan	—	2.6	—	0.0	—
Japan	New York	—	15.2	—	1.6	—
Netherlands	Amsterdam	+	0.1	+	0.5	—
Rumania	London	—	13.8	—	0.4	—

(1) The percentage represents the premium or the loss as far as possible on the national exchange. On the following page may be found the table of reciprocal pairs of the currencies considered; by the aid of this table and the percentages indicated above, it is possible to obtain the reciprocal prices of the different currencies at the rates to which the quotations; of the Monthly Review refer

RECIPROCAL PARITIES OF THE VARIOUS CURRENCIES IN WHICH ARE QUOTED THE PRICES IN
THE MONTHLY AND THE QUARTERLY PRICE REVIEWS (1).

COUNTRIES	Unit of Currency	Germany	Argentina	Belgium	Canada	Denmark	Egypt	France	Great Britain	Hungary	India	Italy	Japan	Netherlands	Poland	Rumania	Czechoslovakia	Former Latin monetary union (3)
Germany	Reichsmark	1	0.561	8.566	0.238	0.889	4.810	0.080	0.970	1.362	0.653	4.526	0.478	0.503	2.123	39.825	8.040	1.285
Argentina	Paper peso	1.782	1	15.563	0.424	1.584	8.540	10.837	1.744	2.427	1.103	8.061	0.851	1.056	3.872	70.959	14.926	2.200
Belgium	Franc	0.117	0.065	1	0.028	0.104	0.503	0.710	0.114	0.159	0.076	0.528	0.056	0.069	0.248	4.649	0.830	0.145
Canada	Dollar	4.108	2.356	35.969	1	3.731	20.290	25.524	4.110	5.718	2.740	19.000	2.006	2.488	8.014	107.181	33.751	5.183
United States																		
Denmark	Crown	1.125	0.631	9.637	0.208	1	5.422	6.840	1.101	1.532	0.734	5.092	0.538	0.607	2.380	44.803	9.045	1.380
Sweden																		
Egypt	Pastre	0.207	0.016	1.777	0.046	0.184	1	1.582	0.203	0.283	0.135	0.689	0.009	0.123	0.441	8.204	1.688	0.256
France	Franc	0.164	0.092	1.400	0.030	0.146	0.703	1	0.161	0.224	0.107	0.744	0.079	0.087	0.340	6.550	1.322	0.203
Indo-China	Plastre (2)																	
Great Britain	Shilling	1.021	0.573	8.750	0.243	0.998	4.923	6.211	1	1.381	0.607	4.623	0.488	0.605	2.169	40.680	8.213	1.291
Hungary	Pengo	0.734	0.412	6.289	0.175	0.653	3.580	4.404	0.720	1	0.479	3.323	0.351	0.485	1.559	29.240	5.903	0.906
India	Rupce	1.532	0.800	13.125	0.365	1.362	7.384	9.316	1.600	2.087	1	0.935	0.732	0.908	3.254	61.020	12.310	1.892
Italy	Lira	0.221	0.124	1.892	0.053	0.196	1.065	1.843	0.216	0.301	0.144	1	0.106	0.131	0.460	8.799	1.776	0.273
Japan	Yen	2.092	1.174	17.024	0.498	1.840	10.054	12.723	2.040	2.850	1.399	9.471	1	1.240	4.443	88.333	16.924	2.683
Netherlands	Florin	1.687	0.947	14.454	0.402	1.450	8.132	10.260	1.652	2.298	1.101	7.637	0.806	1	3.583	67.200	13.607	2.083
Poland	Zloty	0.471	0.264	4.034	0.112	0.419	2.269	2.803	0.461	0.641	0.307	2.131	0.225	0.279	1	18.755	3.786	0.581
Rumania	Leu	0.025	0.014	0.215	0.006	0.022	0.121	0.153	0.025	0.034	0.016	0.114	0.012	0.015	0.053	1	0.202	0.031
Czechoslovakia	Crown	0.124	0.070	1.065	0.030	0.111	0.569	0.756	0.122	0.169	0.081	0.563	0.059	0.074	0.264	4.953	1	0.154
Former Latin monetary union (3)	Gold Franc	0.810	0.455	6.938	0.108	0.720	3.803	4.925	0.793	1.103	0.529	3.666	0.387	0.480	1.720	32.258	6.512	1

(1) Each figure gives the number of units of the currency indicated at the head of each vertical column corresponding to the unit of the currency indicated at the side of each horizontal line. — (2) † Gold piastre equal to 20 francs. — (3) Data for purpose of comparison.

AGRICULTURAL SCIENCE AND PRACTICE

MONTHLY BULLETIN

OF

AGRICULTURAL SCIENCE AND PRACTICE

GENERAL AGRONOMY AND CROPS OF TEMPERATE REGIONS

Results of the "Wheat Days" in Hungary.

During the months of January and February 1931 the National Chamber of Commerce of Hungary organised a series of "Wheat Days", the object being to explain the official attitude towards wheat problems. In this way an attempt was made to find some palliative for the acute crisis of recent years and the consequent difficulties of marketing through more systematic methods of cultivating wheat. The general purpose of the movement was to inculcate certain principles for wheat growing in Hungary, deriving from changed requirements as regards quality, the state of the market and new trade practice. The Wheat Days were so arranged that the best qualified persons in the district were invited to advise on each particular question. The lectures were twelve in number made up as follows: 3 persons representing agricultural science and plant breeding, 3 practical farmers, 3 representatives of the grain and grain export trade and 3 other persons, representing milling and baking.

One afternoon per week for a period of two months was devoted to the lectures and subsequent discussions. The questions brought up for consideration which are set out below give not merely a general idea of the problems affecting wheat growing in Hungary, but also a valuable résumé of all the questions of direct interest affecting the wheat farmer to-day. For this reason a short account of the results obtained may be properly given in this *Review*, even though chief attention was devoted to purely Hungarian problems.

Programme. — The questions to be considered were thus stated in the original programme:—

- (1) What is the difference between the wheat put on the market to-day by Hungarian growers and the wheat marketed before the war?
- (2) How and for what reasons have these changes been brought about?
- (3) How far can the quality of the wheat be modified:—
 - (a) by the kind of seed used?
 - (b) by other factors in production?
- (4) What are the effects of quality characteristics:—
 - (a) on yield and profits?
 - (b) on marketing and sales prospects?
- (5) In what direction and to what extent has selection influenced wheat-growing in Hungary?
- (6) At the present stage of selection work have any varieties been discovered in particular wheat growing areas which are satisfactory alike from the point of view of yield and of quality or are such varieties as yet unestablished.
- (7) What methods should be pursued in wheat selection work in Hungary?

(8) How can effective collaboration be secured among the various plant breeders?

(9) How is it possible to provide for extensive wheat growing a variety which is recognised as the most suitable for any given area both as regards yield and quality?

(10) What are the most suitable methods of obtaining uniformity in type and quality of wheat for exportation (marking, standards, etc.)?

(11) As regards the future, what should be the conditions under which wheat is grown and what are the changes in existing conditions that are considered desirable?

This method of statement may be said to indicate the various phases of the wheat problem and of its development.

Great stress is laid on the question of quality in wheat growing, a matter that has recently aroused much interest not only in Hungary but in a number of other countries.

The place of plant breeding received very special attention and the question was raised whether, in seeking to increase the yield of native varieties, the best course is to make crossings with varieties from other countries. At the same time it was suggested that the attraction of very high yield has not frequently caused the plant breeder to neglect quality requirements. The question involving a comparison of pre-war and present day wheat and question 5, whereby an attempt is made to determine the influence of selection on wheat growing, derive from these discussions. The answer to questions 6 and 7 should go far to solve this problem for the future and also at the same time to supply an answer to the question whether it is possible to realise in a single identical variety a combination of improvement both in yield and quality.

A further and no less important problem is the unification of methods of wheat production and of the wheat product along certain lines. A similar problem is to-day very generally manifest in all forms of agricultural production and is summed up in the term standardisation. The question whether it is possible to introduce definite standards into wheat growing in present conditions brings up the further technical question whether the quality of any particular harvest is mainly influenced by the conditions of the environment where it is grown or by the seed from which it originates.

Results of the discussions. — Considerations of space make it impossible here to reproduce the different views expressed by the various speakers and the following summing up by the President, Count Max De Hoyos, can alone be quoted:—

(1) Although in the course of time certain changes in wheat growing have taken place in Hungary, in general the quality of Hungarian wheat is not thereby affected. On the other hand the requirements of the milling and baking industries and of the foreign wheat markets have been modified.

(2) The natural conditions prevailing in Hungary tend to facilitate the adaptation of wheat growing to a new or changed requirements. Varieties of wheat have already been established which satisfy such requirements.

(3) The quality and size of the wheat crop are in the first place chiefly influenced by the variety cultivated, but results are also affected by natural conditions and the methods of cultivation employed.

(4) There can be no doubt that the natural conditions prevailing in the different areas of the country affect wheat growing in different ways. It appears however that, given a wise selection of varieties, high grade wheat can be grown in

almost every part of Hungary. At the same time environment, alone and by itself, cannot ensure high quality.

(5) Recent policy in plant breeding in Hungary is well suited to new conditions and at the present time numerous varieties are available which show excellent qualitative characteristics. Because however of the effects of different conditions of environment and cultivation methods, at the present time there is no particular variety of wheat that can be grown in all parts of the country with equally good results as regards both yield and quality.

(6) All attempts made to obtain the highest possible wheat yield must pay due regard to quality as well as to quantity.

(7) The results of the cultivation trials made by private individuals and agricultural bodies (such as Chambers of Agriculture, etc.), Institutes which specialise in cereals and cereal products, provide very accurate data in respect to the quantitative and qualitative results that may be expected from different varieties grown in any given region and in certain specific conditions of farming.

These conclusions found support in the majesty of the reports issued and in the speeches during the discussions. There was however a marked difference of opinion as regards the fundamental factors which influence the element of quality in wheat and two quite opposed points of view were vigorously maintained. According to one group, climate and soil or natural factors exercise so powerful an influence on wheat cultivation, especially as regards quality that, even when only the very best varieties are grown, it is impossible that certain areas should be on an equality with others. The supporters of this points of view found their justification in the fact that there have always been certain regions specially famous for their wheat crops, as for example the Theiss district in Hungary which has always had the highest reputation for its wheat. This group would therefore desire that the Theiss district should be reckoned as a definite and well marked wheat growing area, in which the growth of wheats for export should be concentrated.

This point of view is opposed by another group which maintains that a high quality wheat, which can well stand comparison with wheat grown in the Theiss area, can be cultivated in other parts of the Country. They support their argument by the statement that certain wheat varieties everywhere produce crops of good quality and that quality characteristics are much more influenced by the internal elements of the seed than by such external factors as soil and climate.

Neither of these extreme points of view found full support in the discussions, though there can be no doubt that quality is as much affected by environment as by the intrinsic characteristics of the variety chosen for cultivation. Further trials are therefore necessary to determine which are the regions in Hungary which are the best adapted for growing a wheat of the highest standard and which the best varieties to adopt in these different regions.

That this problem was not fully settled is shown by the recommendation, based on the conclusions reached in the debates, made by the Conference to its official organs. The original form in which the point was raised was as follows :—

“ Although at the present time it does not seem opportune to introduce any form of indication of place of origin, in the meantime and until such indication is in fact required, wheat should be standardised in accordance with its intrinsic qualities as *Hungaria I, II, III*, while at the same time the place of origin should also be mentioned ”.

This recommendation is a logical consequence of the difficulties that would be brought about by any over hasty standardisation. At this time of crisis in regard to wheat which interferes with the steadiness and rhythm of the markets, the

constant fluctuations of prices make it impossible to solve a problem of so far reaching importance in any really satisfactory way. It would also appear desirable to await the results of other experiments which have not yet been completed, the results of which should serve as a guide for the production of adequate quantities of wheat uniform in type within the limits of the various regions.

Other recommendations include a reference to the establishment of a National Wheat Council, of which the purpose would be to secure unity of direction as regard the general lines of national policy. National production, under the guidance of such a body, would tend to become more uniform in character, a matter of great importance, especially for the small holder. The work proposed for this Council should begin on experimental lines, taking particular account of the particular conditions of farms of varying dimensions, while at the same time exercising special care to secure general uniformity. The membership should be made up of representatives of agricultural science as also of practical farmer, of the milling, baking and other industries concerned and of the grain and other trades.

This proposal was accompanied by a more general recommendation to the effect that, in view of the suggested scheme for extensive wheat growing on a uniform plan, varieties should be determined which, given similar conditions of cultivation and of climate, would give the most satisfactory results both as regards cropping and quality and thus prove themselves the most profitable. This recommendation met with general approval in which those who favoured the establishment of a variety in which quality is the dominant feature, without attributing much importance to high yield, were associated with their colleagues. The Conference was glad to have the assurance that high yield and excellent quality can be found in combination and that there are already a number of selected varieties, which in favourable conditions, exhibit these two chief factors in an optimum production.

A number of speakers were in favour of strict regulations and of a definite declaration as to the different varieties, which should be cultivated in each area. This view however did not find sufficient support in the Conference for its embodiment in any resolution and all the documentation prepared for the meetings went to show that it is too early as yet to pronounce on this highly important question in the absence of adequate experimental data and information.

On the other hand a resolution was passed to the effect that "*the production and propagation of wheat varieties generally recognised as giving satisfactory results, should be promoted by all possible means. Such means should include such government legislation as would encourage the acquisition of high grade seeds by exchange of the farmer's wheat for selected sowing wheat, financial assistance for the purchase of high quality seed, reduction in transport charges,*" etc.

This brief notice of the "Wheat days" in Hungary clearly shows that practically all the present day problems of wheat as they arise in the older areas of production and as they relate to the question of adaptation to meet the requirements of changed conditions, came up for discussion during the course of the meetings.

E. MOSKOVITS

Publications consulted :—

- (1) KOOS M., A búzanapok tanulságai. — *Mezőgazdasági Közlöny*, Budapest 1931, 2-3 sz., 50 o.
- (2) Various articles in the Hungarian daily and technical press.

Notes.

I. GENERAL AGRONOMY.

Meteorology.

LONG RANGE WEATHER FORECASTING BY SOLAR RADIATION. — In our February number (1931, No. 2, p. 41) mention was made of the promising results obtained by Dr. ABBOTT at the Smithsonian Institution in Washington with forecasting based on solar radiation studies.

The subject is also being studied by Dr. A. F. MOORE at the Astrophysical Observatory of the same Institution. He works with a new instrument for measuring atmospheric humidity, intensity of solar radiation and the 'limpidity of the sky (due to the action of dust and water particles in the atmosphere), and with a view to making the necessary observations is endeavouring to find the highest and driest locality in the northern hemisphere.

Theoretically it is necessary to measure the solar heat absorbed by a black object of 1 cu. cm. situated at the limit of the terrestrial atmosphere. As this condition is impossible in practice the observations and calculations must be made at the earth's surface, but reducing to a minimum the loss of solar heat by absorption by water vapour and dust contained in the atmosphere. For this purpose it is essential to find a mountain which is as free as possible from atmospheric impurities.

Dr. MOORE thinks he has found the desired conditions on a peak over 2100 m. in altitude in the Cape Verde Islands. If however this locality fails to give satisfactory results he will renew his search for a favourable position on the continent of Africa. (*La Meteorologia pratica*, 1931, N. 1, p. 43).

HABOOBS. — Haboobs are severe dust storms which occur in the northern Sudan. They are usually accompanied by a sudden increase in the strength of the wind with a change of direction and by very low visibility on account of the dust raised, while some times they are followed by heavy rain which may turn the ground into a quagmire.

A statistical study of haboobs based on the records of Khartoum during the period 1916-1923 was published in the *Quarterly Journal of the Royal Meteorological Society*, London 1925, vol. 51, p. 25. With the development of aviation which is taking place throughout Africa a knowledge of their distribution, frequency and characteristics, apart from the possibility of forecasting them, becomes of great importance. They have therefore been investigated again by L. J. SUTTON, who publishes (*Ibid.*, 1931, vol. 57, no. 239, pp. 143-161) statistics covering the years 1925-1929 and descriptions of examples of the storms, accompanied by photographs, autographic records of humidity, wind and temperature, and charts showing the distribution of pressure and winds in June and July from 1925-29.

Haboobs have been reported at El Fasher, 800 kilometres west of the Nile, and occur frequently at Kassala, 400 kilometres east of the Nile. They are most frequent near Khartoum, and it is only there that regular records have been kept. The records show that at Khartoum there are about 20 haboobs a year; they may occur at any time, but chiefly from May to September, and are commonest in June. They come generally from the south-east and last from a few minutes to several hours, with an average of about 3 hours. They are very rare between 4 a. m. and 2 p. m. and commonest in the early evening.

The associated meteorological phenomena are :— low visibility owing to dust raised, on occasions to 3000 or 4000 ft.; sharp fall of temperature; usually sudden strong wind; often followed by rain, sometimes by thunderstorm.

T. B.

Soil Science.

CHEMISTRY OF SUBMERGED SOILS. — It is a recognised fact that submerged soils apart from those of rice fields fail to grow satisfactory crops. Hitherto this failure has been ascribed to lack of aeration, lack of nitrites, and other conditions caused by the lack of oxygen. With the hope of throwing some light on the matter, W. O. ROBINSON has carried out some investigations (*Soil Science*, Baltimore 1930, vol. 30, no 3, pp. 197-217) and obtained the following main results.

Submerged soil solutions are radically different from aerated soil solutions in that they contain high concentrations of iron and manganese as bicarbonates. They are also rich in calcium and magnesium and hydrogen sulphide and other sulphides.

The high concentration of these elements is explained in the following way. All normal soils containing organic matter, when submerged, eventually produce gas. The composition of this gas is influenced by the presence or absence of blue-green algae of the *Chlamydomonas* groups. When the algae are absent the gas consists mainly of methane and hydrogen; in the presence of the algae the hydrogen and part of the methane are decomposed, and the gas becomes mainly CO_2 and N_2 . It is CO_2 which holds in solution the ions of Fe, Mn, Ca and Mg and thus increases their concentration in submerged soils, in the presence of organic matter. In the absence of organic matter CO_2 is not formed and the solubility of Fe, Mn, Ca and Mg is not increased under submerged soil conditions.

Soil organic matter however in aerated soils disappears, in some instances very rapidly, when they are submerged, as a result of micro-biological action.

Submerged soil solutions may develop toxic concentrations of ferrous iron, sulphides and commonly manganese. Toxic concentrations are invariably developed in submerged soils protected from the air, and occasionally in bog waters and in solutions of poorly drained soils. Toxic concentrations of ferrous iron and sulphides develop in a few days after submergence, and of manganese somewhat more slowly.

Soils are not made more acid by submergence for short periods except such acidity as is due to CO_2 and bicarbonates. Soils that have been submerged for a long time may be so leached of calcium, magnesium, manganese and iron that they will not support growth.

REDUCED AVAILABILITY OF PHOSPHORUS IN IRRIGATED RICE SOILS. — Water used for the irrigation of rice in Arkansas contains large amounts of calcium, largely in the bicarbonate form, and considerable iron and aluminium. Continued irrigation with this water has made the surface soil in the rice area decidedly more alkaline than the subsoil. The result has been the phosphorus has reverted to slightly soluble forms and is only slowly available to rice, which is a weak feeder on insoluble phosphates.

On the other hand the anaerobic conditions produced by the irrigation may cause a change in the type of inorganic forms of water-soluble phosphorus to organic forms which are not available to plants.

Thus it does not seem advisable to recommend the use of phosphatic fertilisers where land is irrigated with calcareous water, until some means is found to keep the phosphorus in solution. (*Soil Science* Baltimore 1931. vol. 31, no. 3, pp. 209-218).

FUNGUS FLORA OF SOIL IN DENMARK — H. L. JENSEN (*Soil Science*, 1931, vol. 31, no. 2, pp. 12-158) has made a study of the fungus flora of 100 Danish soils of different types and of reactions varying from pH 3.3 to 8.3.

Microscopical examination showed the largest amounts of mycelium in acid soils rich in organic matter.

'Direct isolation' yielded mainly *Trichodermae* from forest, moor and heath soils, and mainly *Mucoraceae* from field, garden and salt marsh soils. Plate counts showed numbers of fungi ranging from 24,300 to 46,000 to a gramme of soil. The *Aspergilli* were found only sporadically in ordinary soils but very abundantly in hot greenhousé soils. The genera *Fusarium* and *Phoma* were characteristic of cultivated soils.

The numbers of fungi showed no relationship to the type of soil, except that very heavy clay soils were poor in fungi; and no relation to the soil reaction was found.

The resistance of fungi to acidity varies considerably, some species growing at pH 1.5, others being checked at pH 3.7-4.2. Only a few of them show a distinct optimum with acid reaction. The pH interval of 5.0 — 6.0 is critical for the majority of the ordinary soil bacteria, and most soil actinomyces are checked in growth at pH 4.4-5. This explains why the addition of lime to acid soils did not markedly depress the numbers of fungi, but stimulated the bacteria and actinomyces.

Fertilisation, especially with farmyard manure, increases the number of fungi in the soil, as well as those of bacteria and actinomyces. In soils of pH above 6 there is a significant positive correlation between the numbers of fungi and of bacteria plus actinomyces.

These results indicate that the abundance of fungi depends on many factors, among others the food supply, but the ratio of fungi to bacteria plus actinomyces seems dependent on the hydrogen ion concentration.

Addition of dextrose to soil stimulated the fungi greatly in acid soil, but little or not at all in neutral or alkaline soil. The bacteria were affected reversely.

Most fungi except the *Mucoraceae* were capable of decomposing cellulose and its addition gave rise to an abundant development of fungi in both acid and alkaline soil.

SOIL MAP OF DENMARK. — An interesting map of Danish soils is published as a supplement to *Die Ernährung der Pflanze* (1931, No. 8). Eight soil types are distinguished: — sandy, sandy-clay, peaty, and those of heaths, dunes, marshes and ancient sea beds.

Sandy-clay soils predominate on the west and east coasts of Jutland and in the eastern islands of Fünen, Seeland, Laaland, Falster and Møen and greatly favour the development of intensive agriculture.

Jutland is crossed from north to south by a wide central zone of sandy with healthy soil in the median part. As a result of land reclamation — liming and the use of chemical fertilisers — these formerly waste lands have become as fertile as the heath soils of the Netherlands.

The heath soil regions are crossed by numerous peat beds of varying length; these occur also but with smaller acreage in the sandy soils of the islands.

In Denmark the ancient sea beds which have emerged more or less recently play a special part. They are partly sandy-clay, partly sandy and in north Jutland contain even extensive peat bogs.

The rocky island of Bornholm has peaty soils in the centre of the sandy soil sand on the shore.

Along the North Sea coast there is a sand dune belt.

The Farøe Islands are formed of basalt rocks and have only small areas of humus-containing soils.

T. B.

Fertilisers.

CONSUMPTION OF CHEMICAL FERTILISERS IN CHINA. — Chemical fertilisers were first used in the south-eastern provinces of Kwantung and Fukien, which still absorb the greater part of the trade; they have also been introduced gradually into the provinces inland and to the north, and the province of Hopel (Chihli) already offers a good market to such fertilisers.

The only fertiliser used on a large scale in China is ammonium sulphate, which is specially adapted to the rice fields. Manchuria imports small quantities of superphosphates from Japan.

It has been attempted to introduce into China other fertilisers and synthetic manure for mixing in the field, but so far the results have not been very satisfactory.

The main suppliers of fertilisers to China, in order of their importance, are Great Britain, Germany, the United States and Japan. (*L'Engrais*, Paris 1931, an. 46, N. 6, p. 187).

STATE OF THE NITROGEN INDUSTRY. — The world production of nitrogen increases rapidly from year to year. In all parts, particularly North America, France and Italy, great efforts have been made to increase the production of synthetic nitrogen and in 2 years the output has been doubled. As however increased production has not been followed by increased consumption large stocks have accumulated. At the end of June 1930 the total stocks had already reached 860,000, and now is nearly 1 million m. tons. Seeing that towards the end of the 1929-30 season a number of new factories producing synthetic fertilisers started work, it may be estimated that for the financial year 1930-31, if progress continues at the same rate, the world capacity of production of pure synthetic nitrogen will exceed 3 million tons to provide for a consumption of 2 million tons. In these conditions if the production capacity of the synthetic factories alone may reach 2,125,000 tons while their possible sales are only 750,000 tons, they will be able to use only 35 % of their capacity. (*La Journée Industrielle*, 26 avril 1931).

PRODUCTION OF SYNTHETIC NITROGENOUS FERTILISERS IN NORWAY. — There are two powerful firms, the 'Norsk Hydro' owning the factories at Rjukan and Notodden, and the 'Odda Smeltewerk' at Odda.

The 'Norsk Hydro' produces the following fertilisers:—

(1) Nitrate of chalk, called Norway nitrate, with 13 % nitrogen and 26 % lime. This is the original product.

(2) Nitrate of chalk by the German system, with 15.5 % N and 26 % CaO.

(3) Ammoniacal nitrate of chalk ('Kalkammonsalpeter'), with 20.5 % N and 20 % CaO.

The first two are granular in structure. The 'Norsk Hydro' is endeavouring to

develop the sale of these rather than of the original nitrate of chalk with its lower nitrogen content. In 1930 this firm exported 50,000 tons of its products to Egypt.

The 'Oada Smetewerk' produces 2 qualities of calcium cyanamide, one with 16 % N and 60 % CaO and the other with 10 % and 60 % CaO. (*L'Engrais*, Paris 1931, an. 46 N. 4, p. 121).

PRODUCTION AND CONSUMPTION OF CALCIUM NITRATE IN FRANCE. — In 1913, France was still importing nitrate of chalk to the extent of 10,000 tons from Norway. She then began to manufacture it not only by the Norwegian process of BIRKELAND and EYDE (oxidation of atmospheric nitrogen in an electric furnace), but also by the oxidation of ammonia. This latter process, which tends to replace the former, transforms ammonia (NH_3) into nitric acid (HNO_3) by burning it in air in the presence of a catalyser. The acid is then saturated with lime.

By means of this new process France was able to produce in 1929 $\frac{3}{5}$ (30,000 tons) of her total consumption of calcium nitrate. (*L'Engrais*, Paris 1930, N. 19, p. 601).

PRODUCTION OF PHOSPHATES IN TUNISIA. — Tunisia yields $\frac{1}{3}$ of the world production, viz, 600,000 m. tons, which is equal to the production of America, $3\frac{1}{2}$ times as great as that of Algeria and twice that of Morocco. According to M. BANCIGNY (*Le Phosphate et les Engrais chimiques*, Paris 1931, N. 1555, p. pp. 37-38) the industry has suffered less than in the other countries from the crisis through which the phosphate trade has been passing for over a year.

PRODUCTION OF POTASH IN THE UNITED STATES IN 1929. — The production of 1929 was the highest reached. The potash salts contained the equivalent of 55,873 tons of K_2O , which is 3 % in excess of the 1928 production.

The potash salts come from natural deposits, from blast furnace ash, from the residues of molasses distillation and (in small quantities) from alunite. (*The American Fertiliser*, Philadelphia 1931, Vol. 74, No. 3, p. 15).

T. B.

II. — CROPS OF TEMPERATE REGIONS.

General.

THE APPLICATION OF SCIENCE TO CROP PRODUCTION. — In 1924 the Institute of Plant Industry was founded at Indore, India, for the study of the crop plant as a biological whole. The plant select for study is cotton. In a brief monograph, A. & G. L. C. HOWARD (Oxford University Press, 1929) explain the chief purposes of the Institute as being: (a) the fundamental investigation of cotton, (b) the training of post-graduate students and (c) the provision of a demonstration of the possibilities of development of Central India. The monograph deals with the organisation, expenditures and work of the Institute and will be of interest to those charged with the administration of agricultural research institutions, as well as to cotton agronomists.

Cereals.

WORLD'S GRAIN EXHIBITION AND CONFERENCE to be held at Regina, Canada, from July 25 to August 6, 1932.

The Secretary reports that efforts are being made to bring together the world's leading experts engaged in technical and scientific work relating to all phases of field crop production and marketing. There will be \$200,500 offered in cash prizes for samples of grain from all over the world. It is hoped that the Conference and the competition will result in a real contribution being made to the general advancement of agriculture.

INFLUENCE OF SEEDING TIME ON GROWTH HABIT AND YIELD IN WHEAT. — *The Journal of Agricultural Research* (1931, vol. 42, no. 8) publishes a report of some interesting experiments on this subject carried out by BAYLES and MARTIN. The experiments were conducted at Moro, Oregon, in the years 1925-27. Thirteen varieties of wheat were sown in 1925 on several dates ranging from Feb. 2 to April 23; 16 varieties the follow-

ing year, ranging from Oct. 14, 1925, to June 4, 1926; and 8 in the third year ranging from Oct. 20, 1926, to May 31, 1927.

The experiments showed that for every winter variety there is a critical spring seeding date after which it will not head the same season. If not injured by drought or winterkilled it will head the second season at about the normal date. There is a wide variation in date of heading between varieties seeded on the same date. Some varieties varied in relative order of heading for different seeding dates during the same season. The critical seeding date for yield is earlier than the critical date for heading.

The critical planting date for normal heading at Morô was Feb. 15 for Hybrid 128 and April 30 for Federation. The other varieties studied ranged between these two. The critical dates are earlier in those seasons when the growing season is early.

Thus the experiments show that the date on which wheat will head depends on variety, date of sowing and seasonal environmental factors.

Leguminous Crops.

TIME OF HARVESTING LUCERNE. = Investigations the best stage for cutting lucerne were started in Ohio in 1925. Since it is obvious that any influence of cutting treatments on later yields must be through the roots, the seasonal changes in amount of roots and root reserves were followed throughout the year. The roots were harvested to a depth of approximately 1 foot.

The chief results were the following: — Any extensive reduction of root reserves of lucerne as measured by total weight of roots per acre always resulted in a reduction in yield and vigour of growth.

Up to the first cutting for hay young lucerne gained in root reserves regularly, both in the autumn of the seeding year and in the spring of the following year. No gain in August was found during the 4 years of the experiment.

The average loss in root reserves in recovery after cutting was 177 lbs. per acre. This was accompanied by an average loss of 0.17 % of nitrogen.

Recovery after cutting was almost always accompanied by a decrease in the percentage of dry matter in the roots of about 4.9 %.

The most favourable condition for storage of root reserves seems to be the combination of a large amount of healthy leaf area with drier weather than is usual. (WILLARD C. J., *Journal of the American Society of Agronomy*, Geneva N. Y. 1930, vol. 22 no. 7, pp. 595-602).

Root Crops.

SUGAR BEET SEED PRODUCTION IN THE UNITED STATES. — It has been found that beet breeding and selection as now carried on in European countries do not develop strains of beets adapted for coping with the conditions under which commercial sugar beets are grown in the United States. For instance, it is essential in America that resistant strains be developed for curly top disease (caused by *Eutettix tenella*), but no progress in this direction can be made by European seed breeders because curly top does not occur in Europe. Also climate and soil conditions influence yield and sugar production, so that it is obviously desirable that strains adapted to specific areas should be produced in the region.

It has been found possible by taking advantage of the mild winter climate of New Mexico to avoid the costly transplanting of the beets in winter and produce seed from plants successfully overwintered in the field.

A bulletin of the United States Department of Agriculture (*Circular 153*) Washington 1931) gives a report of the experiments and recommends practices for soil selection, field preparation, cultivation, irrigation, harvesting and seed cleaning in sugar beet seed production.

VALUE OF BEET TOPS. — Beet tops contain 16.2 % of dry matter, including: — nitrogen 0.34 %, phosphate 0.11 %, potash 0.58 %. If the tops are used directly as fertiliser there results a serious waste of foodstuff that has no manurial value, whereas if they are consumed by stock $\frac{1}{2}$ the nitrogen and $\frac{3}{4}$ of the phosphates and potash remain available for the land, and the bulk of the feeding value (digestible carbohydrates 7.17 %) is not lost. Thus the use of tops as a feeding stuff is the most economical. Care should however be taken to reduce the oxalic acid content by allowing the tops to wilt for a few days before feeding. (*British Beet Sugar Review*, vol. 4, no. 9, pp. 201-202).

A. M. F. & D. K.

TROPICAL AND SUBTROPICAL AGRICULTURE

Review of the most important publications on rubber culture issued in 1930.
(Part II). *

TAPPING.

The age at which rubber trees are taken into tapping differs according to circumstances. If the conditions are favourable, the growth of the trees is quicker and the bark sooner reaches a circumference of 45-50 cm. By means of the statistical method TENGWALL (24) investigated the influence of (1) the altitude above sea-level, (2) the presence of a catchcrop, (3) the planting distance. Data were obtained from 776 plantations in Java. The results may be summarized as follows:—

1. The age at which tapping in Java can begin increases with altitude: at an altitude of 0-200 m. this average age is 6 years, at an altitude of 400-600 m., 7.4 years, at 800-1000 m. 10.2 years.

2. Plantations with a catchcrop (mostly coffee) are on the average tappable later than pure *Hevea* plantations; the difference amounts to $\frac{5}{10}$ to $\frac{8}{10}$ of a year.

3. Closely planted fields are sooner tappable than widely planted fields as the following figures demonstrate.

TABLE V. — *Influence of planting distance on age at which tapping begins.*

	Average age in years when tapping is started
Less than 300 trees per ha.	7.2
300-500 trees per ha.	6.5
more than 500 trees per ha.	6.0

This result will at first sight cause surprise, but it becomes quite comprehensible when it is realized that tapping is started when a certain number of trees per hectare are tappable. This number is sooner attained when a larger number of trees per hectare have been planted. Whether in closely planted fields there is some impediment in growth or not, cannot be concluded from the figures, but it may be assumed that, if such an impediment exists, it is certainly not important.

A method advocated by CRAMER for seedling selection was tried by TAYLOR for testing some clones (25). The special pricking knife and the system of grading of CRAMER were used. The knife makes simultaneously four identical V-cuts in the stem; the cuts are about $1\frac{1}{4}$ inches apart and in the present case they were made at the uniform height of three feet above the junction of stock and scion.

TAYLOR concludes from his experiments that this method of testing can never give more than a rough indication of the capabilities of a clone and that it would be unwise to select material for planting schemes on the result of this test. While some indication of prospective yield may be obtained, no information is afforded on the behaviour of the trees under tapping conditions.

In the U. M. S. good results seem to have been obtained by giving the tapping cooler a smaller number of trees and to begin tapping at an earlier hour (26). It is claimed that tapping at six o'clock in the morning gives a yield of 100 against a

* Part I, see *Monthly Bulletin of Agr. Scienc. and Prac.* Rome 1931, Year XXII, No. 6.

yield of 60 when the trees are tapped four hours later (experiments in Java by VAN LENNEP showed in 1919 a much smaller difference, viz. $100 \div 90$). The smaller task of the tapping coolie allows him to tap more carefully and it is said that on some estates in the F. M. S. the increase in yield obtained by the smaller task and the earlier hour of tapping amounts to 30 %, on others to 18-20 %.

A new tapping method (27, 28, 29, 30) was advocated by Jules BOSCH. In this method 4 tapping-panels are used, which are separated by strips of bark broad 5-6 cm.; a special tapping-knife is used. Two adjoining panels are tapped simultaneously with a three-days system (3 days tapping followed by 3 days rest). The 4 tapping-panels are placed each above one of the 4 main roots or groups of roots.

The method has not yet been investigated thoroughly and a few years experimenting will be necessary before an opinion can be formed about its value. The first results seem rather encouraging.

Some data were collected by an experiment in the Philippines (31) about the results obtained by tapping with different intervals: daily, alternate daily, periodically every 2 days, every 3 days, every 4 days, every 5 days, alternate weekly, alternate bi-weekly, alternate tri-weekly, alternate monthly and every six months. In this experiment the alternate-day tapping was found to be the best from the standpoint of production, economy of labor and non-susceptibility to disease.

Of much more importance than the tapping investigations mentioned may be considered the research of HEUSSER and HOLDER (32) on the new double-cut tapping-system of budded trees.

In my previous review of rubber investigations (1) the interesting experiment of HEUSSER and HOLDER was reported, in which budded trees were tapped with two cuts on adjacent sectors, each of a length of $\frac{1}{4}$ circumference, the vertical distance between the two being 1 metre. This system (the $2 \times \frac{1}{4}$ tapping system with panels "in échelon", as the authors call it) was described in the review mentioned. The experiment was carried out on a large scale: 100 buddings of clone 51, 100 of clone 80, 100 of clone 65 and 2 series of 200 seedlings from selected seed were tapped by the new system and an equal number were used as control trees, which were tapped in the usual way with 1 cut over $\frac{1}{2}$ circumference. Tapping was done on an alternate monthly cycle (i. e. one month tapping, one month rest). In the second experimental year (Feb. 1929-Jan. 1930) 100 trees of clone 53 have been added to the experiment. In the beginning of this second experimental year the average tapping height amounted to 160 cm. and 60 cm. for the clones 51, 80 and 65 and to 187 and 87 cm. for clone 53; it may be remembered that the buddings were grafted in October 1922 and the seedlings planted in the same month. In the beginning of this second experimental year the average tapping height amounted to:—

1. 60 cm. and 160 cm. in the double cut system of clones 51, 80 and 65; 87 cm. and 187 cm. in the double cut system of clone 53.
2. 40 cm. in the single cut system of the control.
3. 17 cm. in the single cut system of the seedlings.

The bark consumption amounted to 45 mm per tapping month. The total yield in this year is to be seen from the following table.

Calculated on 200 buddings as number of tappable trees per ha., clone 51 has given with the new tapping system 840 kg., clone 80 964 kg., clone 65 974 kg. and clone 53 1046 kg. The ratio of production of both tapping systems here compared.

(1) Research work on Rubber Cultivation in 1929. *Monthly Bulletin of Agr. Sci. and Prac.*, Rome 1930, Year XXI, Suppl. 1929-30, No. 2, pp. 334-343.

TABLE VI. — *Total yield in kg. of dry rubber per tree in the 2nd experimental year (Febr. 1929-Jan. 1930).*

		Single cut system	Double cut system
Seedlings		2.31	—
Buddings clone 51		3.17	4.80
" " 80		3.54	4.82
" " 65		3.20	4.87
" " 53		4.17	5.23

amounting to 100: 131 for the four clones tested, agrees: with the result obtained by SCHMÖLE and PRUMMEL for a mixture of clones, namely 100: 130. There are no indications that the new system is more severe than tapping with a single cut on $\frac{1}{3}$ circumference since conditions in relation to brown bast, bark renewal and increase of girth appear to be normal.

In actual practice the tapping of the upper cut proved to be less difficult than was anticipated.

The number of trees that will constitute an easy tapping task under this new system may be estimated at 100-200. The tapping cost would consequently be somewhat higher than in the case of a single cut tapping system. Information about the tapping systems used in Indochina was obtained from a publication of OUDOT (33). On the small plantations, situated on the gray soil near Saigon, the system of one cut over $\frac{1}{4}$, daily tapped, is generally followed; the large estates, situated on red soil, generally apply the system of one cut over $\frac{1}{2}$, tapped every other day. On some small estates a cut over $\frac{1}{4}$ or over $\frac{1}{3}$ is tapped every other day or every other month; on some estates the cut is made over $\frac{1}{3}$ and its tapped every other day or a *v*-cut is applied, tapped in the same way or with another interval of time.

REJUVENATION.

Since high yielding clones and seedling-families of selected parents have been obtained by selection it has become an urgent problem, what is the most economic method of planting old fields with the new strains. In this problem the most prominent questions are: 1. Which is to be preferred, replacing only the poor yielding trees and keeping the good yielding ones ("rejuvenation") or replacing all the trees ("replanting")? 2. What is the most remunerative system of tapping the old trees, which have to be removed, in order to get as much as possible rubber out of them? 3. Is it advisable to bud on the old trees or is it better to plant budded trees from the nurseries?

These questions have been the subject of much discussion among planters and scientists (34, 35, 36, 37, 38, 39, 40, 41, 42).

As regards the first question, it is interesting to remember, that the same arises whenever a field of any other perennial crop plant has to be replaced by another or by another variety. In Java, many fields of *Coffea arabica* have been replaced by Liberian coffee, many fields of Liberian coffee by Robusta coffee, many Robusta and many cacao fields by Hevea, etc. In all these cases the question had to be envisaged, whether a regular replanting had to be carried out or a rejuvenation in which as much profit as possible was gathered from the old crop. In all these cases the conservative method of rejuvenation was at last generally recognised as not advisable, the profits reaped from the old crop being less important than the harm done to the new one by the presence of the old trees. It seems that a similar opinion

begins to prevail in the question of the replacement of old rubber fields. VOLLEMA of the Rubber Experiment Station in Java gave the following enumeration of the drawbacks of rejuvenation (35) :—

1. Each of the old trees which are left standing takes the place of 3 new ones, and, as new clones produce per tree in the 8th year 15 to 25 gram dry rubber per tapping, the old trees must produce at least 35 to 60 gm. if they can be considered valuable enough to be allowed to remain. The number of trees, however, which give this yield is so small in our fields, that the advantage of saving these trees does not counterbalance the practical difficulties.

2. The harm done by the shade of the remaining trees and by their root-system to the surrounding newly planted trees is not unimportant.

3. The most productive old trees are generally standing in groups on the best spots ; in leaving these trees standing, the worst parts of the fields are given to the newly planted trees.

In general accordance with these consideration is the opinion of TAYLOR of the Rubber Research Scheme in Ceylon (40).

It was dubious whether the growth in old replanted fields would be as good as in new fields, but in this respect we may feel quite confident, for even on washed-out soils the growth of the young *Hevea*-trees has been very satisfactory. It must however be emphasized that the use of green manuring plants must not be neglected ; *Centrosema pubescens*, and *Calopogonium mucunoides* are especially useful and, in case the soil is very impoverished, shrubby green manurers (*Tephrosia candida*, *Crotalaria* sp., *Leucaena glauca*) are recommended during the first few years.

Some planters have advocated the method of leaving stumps of the old trees to be used as stock for buds of proved clones, the bud being placed either directly on the old stump or on sucker, (36, 38). The Experiment Station has called the attention to the drawbacks of this method. No success can be expected if the trees are older than 8 years and always the percentage of success with this method is very low (37, 39, 40).

As to the best method of tapping the old trees in order to get as much yield from them in two or three years before their removal, the difficulty is that in the drastic tapping systems — as every day tapping with two cuts over $\frac{1}{2}$ circumference — we have to face the running dry of one or two cuts ("brown bast") (35, 42), a circumstance which may entirely spoil the scheme. There are however cases in which the system of two cuts over $\frac{1}{2}$ circumference at a distance of 20 cm. of each other, daily tapped, gave excellent results, the trees giving during 3 years three times the usual yield (326 kg. per ha.) after which time the bark was consumed. The bark is tapped up to the wood. In other cases the distance between the cuts was made greater or the trees were tapped every other day. The daily tapping system is to be preferred ; if a cut runs dry it is left untapped during some time if this happens too often, the every-other-day system is applied. In most cases the results with heavy tapping have been satisfactory and 2 to 3 times the ordinary yield can be obtained during 2 to 3 years.

It may be remembered that the expression "tapping to death" is somewhat confusing ; no system of tapping causes the death of the tree and the aim of the heavy tapping can only be to obtain the highest yield in consuming the remaining bark.

SELECTION.

The most primitive method of selection is the selection of superior mother trees without the testing of the progeny of each of them. On many estates in the Nether-

lands-Indies fields have been planted with this kind of "selected seedlings". It will be clear, that this kind of selection is unreliable because not in all the selected mother trees the superior qualities are hereditary. Another weak point of this method lies in the fact, that the seeds are "illegitimate", *i. e.* they are the product of uncontrolled pollination.

Nevertheless, in spite of its deficiencies this primitive sort of selection gives planting material which is superior to the ordinary material obtained without any selection of mother trees. The extent of this superiority was till now uncertain, and we are indebted to TENGWALL (43) for important information about this question. TENGWALL compared the yield of a great number of fields in Java, plants with illegitimate "mothertree-seedlings" with that of fields planted with ordinary unselected seedlings. The total number of pure Hevea-fields grown from "mothertree-seed" and used in this investigation was 78 with a total area of 2,713 hectares.

In the following table the yield figures of both categories of fields are given :

TABLE VII. — *Comparative yields of selected and unselected seedling trees.*

Planting year	Yield of dry rubber per hectare, obtained in Java in 1927	
	Fields, planted with "mothertree-seedlings"	Fields planted with ordinary seedlings
	Kg.	Kl.
1916	327	428
1917	518	387
1918	428	364
1919	379	319
1920	365	286
1921	325	271
1922	456	104

The difference in yield is rather important, the fields planted with "mothertree-seedlings" giving a yield which is 20 % to 30 % higher than that of the field planted with unselected seedlings.

A still higher yield is obtained when seed is used of mother trees of high productivity and where it has been proved that the high productivity is an inherent character of the tree and not a consequence of exceptionally favourable circumstances. Such trees are those which have produced high yielding clones. The offspring will be again of a higher quality when not only the mother tree but also the father tree is one which has given a high yielding clone. To obtain offspring of this kind HEUSSER made a great number of artificial crossings (44). In my previous review figures were given of the yield of the best seedling-families (1) obtained by HEUSSER by artificial pollination executed in 1920, of different high yielding mother trees, pollinated by high yielding father trees. The best yielding families were those obtained by the following crossings:— 157 (mother) × 164 (father), 165 × 161 157 × 151, 164 × 161 and 166 × 161. In my previous report figures were given of the yield of these families in their 1st to 3d tapping year (4th to 6th year after sowing out). The yield obtained in the 4th tapping year was published by HEUSSER in his new report. In this 4th tapping year four of the five best yielding families mentioned were again amongst the best yielding but two others also excelled, *viz.* 157 × 161

(1) The name "family" is given to the offspring of the same parent trees.

and 157 × 166. The following table may give information about the yield. The tapping system remained the same, namely, 1 cut over $\frac{1}{3}$ of the circumference, alternate monthly.

TABLE VIII. — *Yield of the six best seedling families, obtained by artificial crossing by Heusser (Sumatra).*

Cross (1920)	yield per tapping in g.		Annual yield per tree in kg.	
	6th year	7th year	6th year	7th year
Mother 157 × father 164	34.65	48.08	5.27	7.26
» 164 × » 161	29.60	45.32	4.50	6.84
» 157 × » 161	26.46	44.40	4.00	6.70
» 166 × » 161	29.21	40.04	4.44	6.05
» 157 × » 166	25.47	36.84	3.88	5.56
» 165 × » 161	31.65	36.12	4.82	5.45

Another impression of the productivity of these legitimate seedlings, all descendants of highly productive father and mother trees, may be got from the following average yield figures of these 1920-crosses: the best 10 % of these seedlings yielded 60 g. on an average, the best 20 % yielded 51 g., the best 30 % yielded 46.5 g., the best 40 % 43 g., and the best 50 % 28.5 g.

The average yield of all the crossings compared with that of illegitimate seedlings is to be seen from the following table:—

TABLE IX. — *Comparative yields of legitimate and illegitimate seedlings.*
Yield per hectare in kg. (Sumatra).

	4th year	5th year	6th year	7th year
Crossings	123	415	490	681
Illegitimate seedlings	47	227	243	385

A second series of artificial pollinations was effected by HEUSSER in 1923; these were all effected with tree No. 204, an illegitimate descendant of tree No. 35, while pollen was used of the trees 204, 36, 201 and 202; the descendants of these crossings gave in their 6th year (2nd tapping year) a yield varying from 10.0 to 29.9 gm. per tapping per tree.

Another and more convenient way to obtain legitimate seedlings than by artificial crossing is to plant two clones together in isolated fields. The seeds obtained in these fields can only be the product of a pollination by pollen of the mother-clone or by pollen of the second clone. For instance in one field different trees of the clones 8 and 15 were planted; the seeds gathered from the trees 8 were either the product of pollination by pollen of the trees 15 or pollen of the trees 8. As self-pollination gives in the Hevea-tree only very few seeds, the chance that the seeds will be the product of the cross-pollination is always greater, but there is no certainty.

As only a small number of trees obtained in this way were tapped, no estimate of the yield per hectare can be given, but only the yield per tree.

TABLE X. — *Yield per tapping per tree of seedlings from seeds of isolated seed-gardens (Sumatra).*

Seedlings 1923)		Number of trees	Yield per tapping per tree in g.	
			6th year	7th year
33	33	20	17.7 g.	19.0 g
8	8 or 8	27	18.9 "	16.4 "
50	50 or 50	39	13.0 "	13.4 "
52	52 or 52	20	12.9 "	14.4 "

As a general conclusion it may be stated that the yield of the different legitimate seedlings, all descendants of excellent father and mother trees, is considerably higher than that of ordinary seedlings. From the best families yields have been obtained, which are as high or nearly as high as that of the best clones. As the individual variation of the seedlings is greater than that of the budded trees, selective thinning gives a higher increase in production with seedlings than with buddings, which means an advantage of seedlings. *It seems therefore not yet settled, what planting material will give the highest yielding fields, legitimate seedlings from selected parent trees or budded trees of the best clones.*

Of the productivity of a great many clones, isolated in Sumatra, HEUSSER has given important information in different reports. In the past year the sixth report appeared (45). These tapping experiments have greatly contributed to our knowledge of the value of different clones, but the drawback is the comparatively small number of trees of each clone. As the figures of the average yield per tree are derived from a comparatively small number of trees (4 to 11 trees of clones planted in 1919, 3 to 23 trees of clones planted in 1920 and 20 to 100 trees of clones planted in 1922), it is not possible to make with these figures estimates of the yield per hectare. Besides we must not forget that we are so far still ignorant as to the best planting distance of each of these Sumatra-clones.

The clones, tested by HEUSSER, were planted in 1919, 1920 and 1922. The year production of the clones, planted in 1919, varied in 1929 from 5.55 to 6.62 kg. per tree, of those planted in 1920 from 3.27 to 5.70 kg. per tree, and of those planted in 1922 from 3.17 to 5.54 kg. per tree.

A comprehensive and succinct review of our knowledge regarding the yield of the most important Hevea-clones in Java and Sumatra has been drawn up by the Directors of the Rubber Experiment Stations in Java (46). The many figures given in this publication can not be reproduced here, but the figures of lowest and of highest yield may be given (of some of the clones the figures are given for the average yield between 4 and 5 years, 5 and 6 years, etc.; for others the figures are given for the average yield between the 4 ½ and 5 ½, between 5 ½ and 6 ½ years, etc.).

TABLE XI. — *Yield of the Java and Sumatra clones per tree per year in kilograms.*

Age		Lowest yield		Highest yield	
4 ½ and 5 years		1.1 kg.	PR 17	1.6	AV 71
5 ½ and 6 "		1.0 "	PR 5	3.8	AV 162
6 ½ and 7 "		1.4 "	PR 4	5.5	AV 152
7 ½ and 8 "		1.7 "	PR 5	6.7	AV 256
8 ½ and 9 "		4.3 "	AV 80	18.9	Tjr. 1
9 ½ and 10 "		4.9 "	AV 50	12.1	Tjr. 1
10 ½ and 11 "		5.6 "	BD 17	11.5	BD 5
11 ½ and 12 "		6.4 "	Tjr. 1	11.8	BD 5

A few particulars more may be given about the yield of the most promising clones.

TABLE XII. — *Yield of some of the most promising clones of Java Sumatra in kilograms per tree per year.*

Year	5	5 ½	6	6 ½	7	7 ½	8	8 ½	9	9 ½	10 ½	11 ½
Clone No.:												
AV 49.	2.9 to 4	—	4.2 to 4.7	—	4.9 to 5.2	—	4.8 to 5.3	—	6	—	—	—
AV 50.	—	2.2	—	5.1	—	5.9	—	4.7	—	4.9	6.0	—
AV 71.	—	—	3.5	—	5.1	—	—	—	—	—	—	—
AV 152.	—	—	3.8	—	5.5	—	6.7	—	—	—	—	—
AV 256.	—	—	—	—	—	—	—	—	7.8	—	—	—
BD 5.	—	—	—	—	—	—	—	—	8.4	—	7.9	8.2
BD 10.	—	—	—	—	—	—	—	—	7.6	—	11.5	11.8
Tjir I.	—	—	—	—	—	—	—	13.9	—	12.1	—	—
Tjir XVI.	—	—	—	—	—	—	—	10.9	—	10.8	—	—

The publications on rubber selection, issued by the Rubber Research Institutes of the F. M. S. and Ceylon (47, 51, 52, 53, 54) did not record new facts but contained indications for the selection work.

Technique of budding. The technical part of the budding operation no longer offers serious difficulties, but in Java the percentage of success is on some estates often not higher than about 60 % in general the percentage fluctuates between 69 % and 83 % (see the investigations of VROLYK and RAMAER, mentioned in the previous review). DE VRIES (48) lays stress on the fact, that success is mainly dependent on the stage of growth of the budwood and the stock. Budding succeeds best when the new sprout has just developed and its leaves are still very small, brownish in colour and stiff. In this case as much as 100 % of the buddings may succeed. When the leaves are a little larger and already hanging, the percentage begins to decrease. It is therefore advisable to choose in the nursery as stock plants those which are just in the stage first described. The method of choosing the plants in the nursery makes it impossible to bud regularly one row after the other, which fact complicates the work, but the advantage is that the success of budding is greater, and this is especially important when one deals with expensive budwood of new clones.

The comparatively short time during which stock and budwood are in the condition of growth most suitable for the budding operation makes it desirable to have the budding work finished in the shortest time.

One of the planters in Java (49) advised therefore to make a more practical division of the labour of the coolies, to whom the budding work is entrusted. He observed that quicker work is obtained when the work is organised as follows: 3 labourers are used for cutting the bud-patch, 6 for fixing the bud to the stock, 6 for applying the waxed bandage, 3 for making the cut into the stock. In this way 1500 buddings could be made per day with a gang of 18 labourers; the success varied between 81 % and 92 %.

The best way of planting out the budded plants is still a subject of discussion (51).

No other vegetative reproductive method besides budding is practised on plantation scale. Two planters in the Netherlands Indies called independently of each other attention to the marcotting method (55, 56). Though in more than one respect the method does not seem to compare favourably with the budding method, it may be said that the experience made with marcotting seems interesting and the method worth consideration.

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Notes.

"CRIN-VÉGÉTAL" IN MOROCCO. — This product is prepared from the leaves of the dwarf palm *Chamaerops humilis*. After the leaves have been cut they are transported to the factory, where about 15 frs. is paid per quintal (± 0.50 Am dollars).

Here the leaves are made into small bundles, which are treated by grooved rollers revolving at high speed. The leaves should be fresh and to ensure this they are kept wet. Some of these machines are driven by hand, others by engine power. The best known are "Albisson" and "Zem" of Algerian manufacture.

The product made in this way is assorted according to fineness into . extra superior, mixed and medium. The "extra" is not much in demand. The fibre is spun into cords of 8 to 12 m. length. These are pressed into balls in which form the produce is exported.

After leaving the "factory, the fibre is dried in the sun. To make it more resemble the animal product, it is often dyed black, which increases its value considerably.

Native labourers are paid according to quantity. The leaf sorters and bundlers receive frs. 1.50 to 1.75 per hundred bundles of 200 to 250 grammes each; the labourers who treat them receive 5 to 6 frs. per 100 kg. treated leaves. The cordmakers get 8 to 100 cords.

This fibre is used for ropemaking and upholstering. During the war there was a large demand for it, after which there came a slump. But in recent years demand has increased again. Exports from Casablanca amounted to 9855, 14 324, 17 080, 24 590 and 55 028 metric tons for the years 1925 to 1929 inclusive. The principal importing countries are France, Germany, the United States, Italy and Belgium. At the end of November 1930 prices paid for it were: superior, frs. 70-75 per quintal (± 2.30 \$), mixed fr. 60-65 (± 2.0 \$), medium fr. 40-45 (± 1.40 \$). (*Feuille de Renseignements de la Dir. Gén. de l'Agr., du Comm. et de la Col. du Maroc*, 1930, 15 December):

IMPROVING NATURAL PASTURES IN SUB-TROPICS. — In spite of the fact that in many areas of the country the quantity factor of the grazing appears ample, experience according to *The Rhodesia Agricultural Journal* of February 1931, has taught stockbreeders that high grade or pedigree cattle rapidly lose their productive capacity when grazing in natural pastures without supplementary feeding. Even scrub stock in many parts of the country require supplementary mineral feeding. It is realised by the majority of farmers that there is apparently some deficiency in natural grazing.

Analysis of the natural herbage shows that the protein and mineral con-

tents of the ordinary grasses are considerably lower than those of improved pastures in Europe.

Although in some cases it may be necessary and more practicable to feed minerals in the form of licks to the animals, it must not be forgotten that such methods exercise but little influence on the carrying capacity of the land and cannot be expected to correct or improve the palatability, digestibility or nutritive value of grazing. All these factors are influenced by treatment of the soil. By this method the quantity factor is increased and at the same time the feeding value of the grass.

In addition to the question of fertilisation, there is the all-important problem of method of grassland management. Results of recent experiments carried out at the Salisbury Experiment Station (South. Rhodesia) show that the value of natural grass rapidly falls after the rains have ceased and that one ton of hay cut at the beginning of April is equal in food constituents to two tons cut in May.

This result alone means that even on very poor pasture the cutting of the grass for hay at the correct time results in a product having twice the protein content of the grass left standing in the pasture.

In order to ascertain the difference in the feeding value of wild grass during each month of the year a series of analyses of the wild herbage has been carried out on the same plots that were used for the *fertilising* experiments. In addition to these analyses several small areas were marked off on the plots, which were to be cut regularly each month to simulate rotational grazing.

The following results were obtained.

The bulk of the hay obtained over a period of two years from a plot which received a normal dressing of complete fertiliser was 132 % higher per acre than from a corresponding adjoining plot which received no fertiliser. In the latter plot the yield was just over 1 $\frac{1}{4}$ tons per acre, in the former it was just over 3 tons.

The crude protein content of normal wild grass was found to be much below the standard of natural average European grass. It was highest in January with a total of 7.4 % after which it rapidly declined to 1.73 %

Monthly clipped grass gave much higher figures, rising to 10.79 % crude protein at the beginning of March and only falling to 9.09 % in April, when the rains had ceased.

The phosphatic content of the grass clipped monthly was strikingly higher than that of the mature herbage. The former reached its summit in March with 0.841 % of P_2O_5 , or more than 2 $\frac{1}{2}$ times the amount contained in the mature grass on the same date.

Ether extract is consistently low and crude fibre very high, but the latter decreases steadily under close-grazing practice.

The nutritive ratio of the mature herbage rises from 1 : 11.4 at the height of the growing season in January to 1 : 53.4 in October, the average from May to November being 1 : 48.8. On the other hand the close-grazed plots show an average of 1 : 10, the ratio narrowing to 1 : 7.3 in March.

GUAYULE RUBBER. — The formal opening of the guayule extraction factory of the American Rubber Producers, Inc. took place near Salinas, Monterey, County, California, on February 6 of this year. The new factory is located on the Southern Pacific Railway and is, according to the *India Rubber World* of March 1, 1931, designed to take care of the plantings made on nearly 7,000 acres; each year about 12,000 acres will have to be handled, then coming into maturity. The daily capacity is 15,000 pounds.

Machinery has been developed for the harvesting of the seed, the sowing of the seed-beds, for transplanting and cultivation and for the digging of the mature shrubs.

In the first step of manufacturing screw conveyers take the chopped shrubs to heavy macerating rolls, which feed four large tube mills in the first of which water is added. These mills contain flint pebbles and their function is to grind up and water-log the woody fibre, break down the rubber containing cells of the cortex and agglomerate the minute sponges of rubber into aggregates the size of a grain of wheat. When discharged from the fourth mill, the pulp is washed, diluted with fresh water and fed to a separation tank in which the rubber and cork float and the waterlogged fibre sinks. The contaminated rubber goes to high pressure hydraulic chambers into which water is forced under 350 pounds pressure to cause the non-rubber material to sink.

The rubber is then conveyed to another tube mill where it is scrubbed with rubber covered lead balls to remove the last trace of dirt, and dried in a vacuum drier chamber.

Seeds are harvested by a vacuum cleaner mounted on a light car passing over the rows of plants. This machine will accumulate enough seeds in one day to supply plants for one hundred acres. After a special treatment to insure germination they are sown on seedbeds 4 by 180 feet; each bed produces 24,000 plants, enough for three acres of field. One tractor-drawn seeder plants one hundred such beds in four hours while rolling in a light sand covering. During summer the nurseries are watered by an overhead spray; three men take care of one hundred beds. In February the plants are topped to within an inch of the ground, dug and sorted, all with special machinery. A tractor-drawn planter sets them out six rows at a time on evenly spaced at 28 inches at a rate of 160,000 a day on twenty acres.

For the next four years it is necessary only to chop down competing weeds and in this work special six row one-man cultivators are used, covering five acres an hour. Early in the third year the plants are large enough to shade out weeds.

When the plants are nearly four years old, they are uprooted to a depth of ten inches with a two row tractor-drawn digger. After machine beating to free the roots from adhering soil, they are left partially to dry in the field in windrows of four rows each. The plants are then picked up by special tractor-drawn machinery that chops them into $\frac{1}{2}$ inch sections and blows the chopped material into trucks and trailers that move across the fields with the chopper.

Up to the present, it is stated, most of the available guayule rubber has been used in coating or frictioning the cotton cords used in building tire castings, but it has also a wide and proved field of usefulness for inner tubes and as a plasticiser of tire tread stocks. These uses would utilise an annual output of 100,000,000 pounds. Methods have been fully developed now by Dr. DAVID SPENCE of the Company which removes the resins containing this rubber.

IDENTIFYING HEVEA CLONES. — In this Bulletin (No. 2, 1931) some information was given on a new method developed by Dr. BOBILIOFF of Buitenzorg (Java) for the identification of rubber clones.

More complete information is now to be found in *De Bergcultures* of 27 December 1930. At present a Hevea clone is identified by external morphological characters. In the new method the clones are distinguished by a definite chemical reaction of the latex. The identification is independent of the age of the plant.

To apply the method a few drops of latex are taken from young or halfgrown leaves by cutting through the leaf-stalk where it is attached to the branch. The drops that appear on the cut surface of the stalk are collected on a porcelain plate, preferably one with depressions. In each depression the latex from one tree of the clone that is being examined is collected. Three to five leafstalks will give sufficient latex for the reaction. To this small quantity of latex is added a reagent concerning which no particulars are given except that it is (1) a new discovery, (2) a colourless solution, (3) that the mixture of latex and reagent is white. In a short time, from half a minute to a few minutes, the latex begins to colour and this colour increases in intensity. The time of colouring, the shades of the colour, the intensity of the colour are different in different clones. The clones BD 2, A. V. 256 and Fiji I, for instance, show in the second stage of reaction respectively, purple, red and blue. These differences can be seen clearly in from 6 to 10 minutes.

The method has been applied to a great number of clones in the experiment station at Bristenzorg and on several estates in West Java where corresponding results were obtained.

COCA IN PERU. — In the *Tropenpflanzer* of March 1931 J. WILLE gives a description of the culture and use of coca as practised in Peru.

Two varieties are distinguished: *Erythroxylon coca* and *E. novogranatense*. The first is the most common and has larger leaves than the second. This however produces more leaves. It may be remarked that in Java only *E. novogranatense* is cultivated.

To succeed well it is of importance to choose only humid and hot locations as plantation sites. As regards soil conditions the coca shrubs does not show special preferences, but all sandy, loams, well drained and not too poor in humus give good results. To establish a new plantation, the usual practice is to plant seeds in a nursery, which should be of a more sandy character. As the seeds lose their germinating power soon, only fresh seeds should be used. The use of shade in the plantation is important and should be regulated according to the special conditions of the site. In young planta-

tions it is provided for by interplanting with maize or cassava, bananas and coffee are useful in a later period. The *Inga* tree, which is also used very much in coffee plantations, is regarded as a useful shade plant.

The young leaves are not harvested, plucking is not done before the bark of the twigs on which the leaves are grown has become brown coloured. It takes about 4-5 years before the shrubs have developed sufficiently for picking. At that time, they will be about 1-1 $\frac{1}{2}$ m. Every 3-4 months there may be a harvest, which gives an average yield of 275 kg. of dried leaves per ha. The yearly production per ha, may be estimated at about 900 kg.

After picking the leaves are dried on a drying floor; sometimes by hot air. The largest part of the production is used for consumption by the Indians, who chew the leaves. Another part is used for the extraction of raw cocaine in small factories; the rest of the leaves is exported.

The principal centres of production are to be found on the east side of the Andes, belonging to the Amazon basin in the departamentos La Libertad, Cajamarca, Junin, Ayacucho and Cuzco. The most important is the department of La Libertad with an average production of 920 m. tons dry leaves; that of all others is about 520 tons.

Exports were in 1928. — 150 tons leaves and 625 kg. of cocaine; in 1929 101 ton leaves and 236 kg. cocaine. About one-third of this export is directed to Germany.

M. B. S.

ANIMAL HUSBANDRY

Notes.

General.

ANIMAL PRODUCTION AND STOCK DISEASES CONGRESS, PARIS 1931 — The Directors of the International Colonial Exhibition organised a national fortnight for overseas agricultural production (Paris, June 17-July 1, 1931), divided into 8 Congresses, the first of which was concerned with problems of animal production (17-18 June 1931). The agenda were as follows:—

- (1) Breeding. Feeding. Utilisation of all exploitable animals.
- (2) Wool, leather, hides, various bye-products.
- (3) Dairy products. Feeding of colonial populations.

CONGRESS OF THE INTERNATIONAL EQUESTRIAN FEDERATION, PARIS, MARCH 24-26, 1931. — The Congress discussed and modified certain points of the general regulations for horse racing. General Guy Henry (U. S. A.) was elected as the new President of the Federation.

Feeding.

CONTROLLED GRAZING IN VICTORIA, AUSTRALIA. — According to an address delivered at the annual Convention of the Chamber of Agriculture by H. A. MULLET, Agricultural Superintendent (published in the *Journal of Agriculture of Victoria*, March, 1931), it will pay to embark upon a programme of subdivision of pasture land with a view to adopting the policy of alternately concentrating stock on and resting the paddocks, not upon a rigid rotation plan but at least on a systematic grazing plan in which due regard is paid to the modern principles of pasture management and to the modifications required to meet local conditions.

CHANGES TO STOCK FROM POISONOUS PLANTS FOLLOWING SPRAYING WITH SODIUM CHLORATE. — The Livestock Division of the New Zealand Department of Agriculture publishes in the *N. Z. Journal of Agriculture* (January 20, 1931) a warning in connection with the use of sodium chlorate solution when sprayed on poisonous plants. It has been observed that plants poisonous to stock, but not readily eaten normally, become attractive to them after being sprayed with sodium chlorate. In such instances mortality might result from the ingestion of the toxic plant. It is therefore a wise precautionary measure to ensure that the access of stock to recently sprayed poisonous plants should be prevented.

Cattle.

AUSTRALIA'S BEEF INDUSTRY DECLINING. — According to the *Live Stock Journal* (April 1931) beef production in Australia is on the decline both in quantity and quality, partly owing to the low values ruling for cattle since the conclusion of the Imperial meat contract for war purposes and partly on account of the great extension of sheep raising for wool production, which has until recently proved a more profitable industry.

AN INTERPRETATION OF THE FEEDING STANDARDS FOR GROWING DAIRY CATTLE. — In experimental work in feeding growing dairy animals there is a need for definite standards of feed requirements. It is necessary to use some guide, first to ensure that animals receive sufficient nutrients and, secondly, in order that trials may be accurately repeated. According to J. B. FITCH and R. H. LUSH (*Journal of Dairy Science*, March 1931), the standard of ARMSBY is limited by the fact that the net energy content is not known for all feeds. The MORRISON standard is adaptable to more general use, especially in experimental trials with new feeds or those of varying composition that can readily be analysed. Also it can be used for larger animals, while the ARMSBY standard gives only figures for animals not weighing over 800 pounds. Changes are suggested for the MORRISON Standard and tables given to facilitate the quick interpretation of such standards. The choice of the standard to follow will depend somewhat on the type of experimental feed used.

EFFECT OF FEEDING MENHADEN (FISH) OIL TO DAIRY COWS — According to investigations made by J. B. BROWN and T. S. SUTTON (*Journal of Dairy Science*, Baltimore March 1931) feeding oil of menhaden (*Brevortia*) to a dairy cow lowered milk production, the percentage of milk fat and total butter fat. After resumption of control, diet recovery to normal took place slowly. The analytical constants of the butter changed to those of a mixture of butter with menhaden oil. Several specimens of normal butter have been shown to contain small quantities (0.3 per cent) of a highly insaturated fatty acid similar to arachidonic acid.

A GUERNSEY NON-PEDIGREE SUPPLEMENTARY REGISTER. — From time to time the council of the English Guernsey Cattle Society has had the idea of popularizing the Guernsey type of cow among purely commercial farmers, inspired by the success of "grade" Guernseys in the United States. The following is a statement by P. GORDON in the *Farmer and Stock Breeder*, March, 1931:—

"Outside pressure has grown so powerful that the formation of a non-pedigree branch of the Society or some such solution seems inevitable. Among owners of non-pedigree stock there is a very definite wish for the establishment of some link which will give a greater encouragement and assistance to those whose interest in the breed is based wholly on commercial grounds and not on show points".

HOLSTEIN FRIESIAN ASSOCIATION OF AMERICA MOVES OFFICES. — Two of the three offices of this Association, the world's largest live stock record association, with more than 31 000 members and 2 100 000 registrations of purebred Holsteins, are now established in their new home at Madison, Wisconsin.

Sheep.

STUDY OF THE BOUKKARA SHEEP, PARIS, MARCH 1931. — In connection with the Agricultural Competition of 21 March the French National Acclimatisation Society organised a day of study of the Boukkara sheep. The programme included:— History of the introduction of the Boukkara — An account of the present state of its breeding throughout the world — Adaptation of the sheep to France — The problem of cross-breeding — Economical breeding of the Boukkara — The trade in Astrakhan fleeces.

PRICKLY PEAR AS A FEED FOR SHEEP. — Certain varieties of prickly pear have only very fine, easily detachable spines. These varieties are easily cut or may be grazed directly by stock. Spiny varieties must first be fired to burn off the spines.

In the following table the food value of the prickly pear is compared with that of other foods.

	Dry matter	Digestible protein	Digestible carbo-hydrate	Digestible fat
Prickly pear	10.4 %	0.4 %	5.8 %	0.1 %
Lucern hay	91.4	16.6	39.0	0.9
<i>Atriplex rummularia</i>	23.3	2.8	5.9	0.2
<i>Atriplex semibaccata</i>	27.3	2.9	6.6	0.1
Maize ensilage	26.3	1.1	15.0	0.7
Mangolds	9.1	0.8	6.4	0.1

As regards digestibility prickly pear is comparable with maize ensilage.

Its high water content (80-93 %) has enabled sheep grazing on prickly pear to go without drinking for 525 days. (H. VELU in the *Régence de Tunis, Bulletin de la Direction Générale de l'Agriculture*, 1931).

D. K.

Pigs.

EXPERIMENTS IN GERMANY AND HOLLAND ON THE INTENSIVE FEEDING OF PIGS.
— The results of some interesting recent experiments are given below.

I. — *Experiments by the Dutch Stock Feeding Bureaux.* — The main results were as follows:—

(1) In the three trials carried out no typical difference was found between breeds as regards rate of growth. Individual differences in a single breed exceeded those between different breeds.

(2) It is not beneficial to give much grass to pigs fed intensively in the sty.

(3) Grass, however, by producing less rapid growth had a beneficial effect on the quality of the bacon.

(4) Grazing with a supplement of barley and whey gives very good bacon. A supplement of fish meal did not increase growth and had no effect on the proportion of lean.

(5) The addition of food oils (including cod liver oil) to a ration of barley, maize, fish meal and (at the beginning) whey, increased the daily rise in live weight and reduced the quantity of meal required to raise the weight by one kilo.

(6) Substituting cassava meal for maize meal did not lower the rate of growth but greatly reduced the quantity of food required to raise the live weight by 1 kg.; the fat became more firm.

(7) Intensive feeding combined with grazing is advantageous.

(8) Until the pigs reach a weight of 100 kg. dry feeding is successful. Between 100 and 150 kg. it is better to moisten the meal.

(9) Skim milk produces an optimum effect when about 1.5 kg. are mixed with 1 kg. of mixed grain. Replacing skim milk by protein-rich foods such as sunflower seed cake, groundnut cake or oil-free soya cake, had no beneficial effect.

(10) A good result was obtained by adding to 75 kg. of a mixture of plant meals and whey, 4 to 5 kg. of meat meal. Ground cabbage palm cake is a good supplement to maize, recently weaned pigs taking it without ill effects.

By giving to pigs precipitated calcium phosphate, meat meal and green feed, heavy and adequately fleshed animals are obtained under cover.

(11) In feeding maize meal + barley meal + whey there is no advantage in substituting fish meal for the maize meal.

(12) Up to the time for slaughter pigs may be fed a daily ration of 250 gm of pure fish meal without its affecting the flavour. The fat constants are however modified: the melting point is lowered, the iodine and refraction indices are raised; these alterations are more apparent in the fat of the back than of the kidneys;

(13) In the feeding of young pigs weighing at the start 20-25 kg, which are receiving barley and maize, skim milk and whey can profitably be replaced by fish meal and water.

(14) Whereas a mixture of meals of meat, soya and coconut costs 14 Dutch cents the kilo, skim milk for pig feeding costs 2.1 cents a kilo.

(15) With pigs fed up to London market weight whey may be stopped at the end of 10 weeks.

(16) Pigs can thus be fed intensively to a weight of 91 kg. (200 lbs.) without supplying skim milk.

(17) In certain experiments designed to compare the use of skim milk and fish meal, pigs fed the former were usually superior in respect of growth but were also the larger feeders.

(18) Experiments in Denmark have shown that 1 kg. of meal may be replaced by 1.1 kg. dried beet pulp up to 10 % of the ration. In the province of Gueldre (Netherlands) results less in favour of mangolds were obtained:— 1 kg. of dried beee pulp was found equivalent to 1.36 kg. of meal. On the other hand in Friesland the results were exactly opposite:— 1 kg. of dried pulp was equivalent to 1.36 kg. of meal. (*Landbouw Courant*, 20 November 1930).

II. — *Experiments of the Zootechnical Institute of the University of Göttingen (Germany)*. — Prof. J. SCHMIDT carried out experiments to determine to what extent dried sugar beet, coarsely ground ('Zuckerrubenschrot'), may be substituted for crushed grain in the intensive feeding of growing pigs. The daily rations were as follows:—

To obtain a final weight of 50-70 kg: 2 500 gm. of a mixture of crushed barley (70 %) and 'Zucherrubenschrot' (30 %) + 160 gm. of fish meal + 200 gm. of dried yeast.

To obtain a final weight of 70-100 kg.: 3 000 gm. of a mixture of barley and beet + 180 gm. of fish meal.

Results. — From the point of view of the utilisation of the foods and the development of the animals the substitution of 'Zuckerrubenschrot' for 30 % of the crushed barley had no drawbacks; on the contrary, the increase weight of the experimental pigs was remarkable and their utilisation of the foods was considerably better than in the control animals tested at the Institute. Feeding costs were approximately equal.

The butchery products (tankage, distribution of fat and lean) differed little; the consistency of the lean and fat was however less good in the experimental animals and further trials will be necessary to test whether this was due to the feeding. (*Zeitschrift für Schweinezucht*, 1931, Nr. 13).

III. — *Experiments of the Zootechnical Institute of the University of Halle (Germany)*. — MM. FRÖHLICH and LÜTHGE undertook a comparison of pig feeding with and without automatic feeders. The latter undoubtedly save labour, particularly on farms having inexperienced hands, but they have certain drawbacks. The numerical results of the experiment show that with dry foodstuffs in the automatic feeder the pigs utilise the food less well than with the usual moist food in a trough. (*Zeitschrift für Schweinezucht*, 1930, Nr. 50)

Poultry.

POSSIBILITIES OF THE POULTRY INDUSTRY IN SOUTH AUSTRALIA. — C. F. ANDERSON, Government Poultry Expert, stresses in the *Journal of the Department of Agriculture of South Australia* (February 16, 1931) the opportunity for a higher production of the poultry industry in this State. With regard to the production of poultry and eggs, the states, South Australia is fortunately situated. It has one of the finest climates of the world both for the rearing and production of poultry, its utility strains of poultry are unequalled in any country, it has all the necessary foodstuffs, it is not necessary for one penny to go out of the State either for plant, equipment, stock or food, and as a ruling consideration, it has a payable export Empire trade for all eggs likely to be produced in the country.

Sericulture.

SERICULTURE IN SOUTHERN RHODESIA. — In the *Rhodesia Agricultural Journal* (January, 1931) it is stated, that as far as can be seen, the mulberry of the variety for feeding silk worms will grow profusely, all over the territory of Southern Rhodesia. Climatic conditions appear to be satisfactory in as many places as are necessary for sericulture to become an important industry. To accustom natives to the industry and to get them to build rearing houses will be a slow and arduous process. The industry should be carried on by both Europeans and natives. The hibernation of the eggs in the territory itself is a condition *sin qua non*. The supply of eggs and mulberry cuttings should in the early stages be gratuitous and in due course grants-in-aid to natives for building rearing houses should be considered.

E. M. & S. T.

AGRICULTURAL INDUSTRIES

Notes.

Industries of Plant Products

BLEACHING OF FOOD MEALS. — In *La Vie agricole et rurale* (Paris, 1931, N. 5) P. BRUTÈRE gives biological and physico-chemical reasons for discarding treatments of food meals with chemicals for bleaching purposes.

One of the physico-chemical reasons is the risk involved in the use of chemicals which are rarely free from inorganic impurities. Another reason is the yet imperfect knowledge of the alterations caused in proteins, lipides, glycodes and other factors such as diastases, inorganic elements, co-ferments, vitamins, etc. by chemical treatment.

Apprehension is justified by the skin affections caused by foods and the numbers of cases of toxic disorders, etc., due to chlorine-bleached flours.

TREATMENT OF MEALS WITH SULPHIDE OF CARBON — A. J. J. VANDEVELDE has shown that powdered takadiastase, trypsinase, pancreatin and rennet retain their specific properties (as do malt amylase and powdered pepsinase) after treatment with CS₂, which makes possible the sterilisation of meals without loss of enzymatic properties. (*Bulletin de la Classe des Sciences*, Bruxelles 1930, N. 12).

MAIZE PRODUCTS. — A report delivered by C. MARCILLER to the Maize Congress (Pau, October 1930) gives an interesting survey of the principal industries for the treatment of maize, such as the milling industry, which produces meals, brans and brewery products, and starch manufacture, which usually also produces glucose and dextrine. The residues are also utilised, a valuable oil is extracted from the germs and highly nutritious stock feeds from the cellulose and nitrogenous material. It is in the interests of the industry that the maize treated should be rich in starch. The following table shows that there is considerable variation in the composition of maize.

	After MOFFET	After CORONEL (averages)
	%	%
Starch	80-85	58
Oil	3-4.5	4.5
Ash	1.2-1.3	1.5
Pentosans	7-7.5	7
Cellulose	1.2-1.5	1
Proteins	8-10	13
Water	—	15

Treatment of a medium maize between these limits may, according to MOFFET, give an industrial yield of about 95 % of the weight of the maize.

The processes in use in starch manufacture are highly perfected and uniform in principle. The maize is steeped in sulphurous water circulating regularly; this water on concentration gives a syrup which is incorporated with the gluten meal before drying. (The treatment of maize with alkalis followed by fermentation is now totally abandoned). The grain is then lightly crushed and the germs removed by shaking; the light germs rise to the surface and are separated, while the heavier starchy mass is extracted from below. The germs are extracted by pressure, yielding maize oil and oil-free germs. The germ-free maize, is crushed in water, giving a paste which is then strained. The starch 'milk' obtained contains the gluten; the cellulose remainder held by the strainer is then dried. The starch is precipitated from the 'milk' and then has to be purified and dried. The gluten is then separated and dried.

The milling of maize is similar to that of the hard wheats. A preliminary removal of the germs is however necessary and is effected either dry by special machinery or after slight steam baking. From the germs oil is extracted as in starch manufacture.

The by-products of milling and of starch manufacture are excellent stock and poultry feeds. The composition of some is given below.

	Gluten semolina	Maize oilcake	'Glob-azoté'
	%	%	%
Nitrogenous substances	28.1	25.8	47.75
Fats	2.2	6.4	4.1
Non-nitrogenous extractives	43.7	45.43	34.35
Cellulose	6.8	11.86	1.72
Inorganic substances	6.6	3.36	1.96
Water	12.6	7.29	9.22
Food units contained in 1 kg.	0.9	1.1	1

D. W. KAUFMANN gives the following composition for the American products :

	Oil-free germs	Bran	Gluten meal
	%	%	%
Water	9.50	8.93	9.74
Protein	21.30	10.50	31.20
Fats	13.29	2.75	2.35
Carbohydrates	45.65	65.04	54.67
Cellulose	8.27	12.30	1.44
Ash	2.00	0.48	0.60

Whether in starch manufacture, milling or distilling, the entry, cleaning and storage of the grain are the same

Attempts have been made to extract sugar from maize stalks or to use them for paper manufacture, but without any extensive success owing to the competition of more suitable materials. The use of maize cobs for producing furfural is proposed

The starch obtained from moist maize, called 'green' starch, is dried for direct sale or slightly acidified and heated for the production of dextrines. Green starch is transformed into glucose by saccharification under pressure followed by saturation. Two forms of glucose are obtained :— the crystal syrup used in confectionary and the solid glucose used in brewing, biscuit manufacture, artificial silk manufacture, etc.

The distillation of the grain is based on a treatment for transforming the starch into maltose or glucose, which are sugars readily fermented by yeast with the production of alcohol and carbon dioxide. Three processes are recognised :— (1) the old 'acid' process, (2) the 'diastase' or 'malt' process and (3) the *Mucor* process, which consists in treating the maize, after it has been cooked and cooled again to 38°, with the fungus which converts the starch into fermentable sugar and then into alcohol. This process was established by Dr. CALMETTE. An enzyme enabling acetone and butyl or ethyl alcohol to be obtained has been isolated by M. FERNBACH.

M. MARCILLER discusses particularly the economic side of the question. (*Agriculture et Industrie*, 1930).

UTILISATION OF RICE FLOUR IN BREADMAKING. — The investigations carried out by L. BORASIO and the very satisfactory results that have been obtained show that the greatest degree of success is secured under the following conditions :—

1. Rice flours employed must have a strength in proportion to that of the wheat flours with which they are blended ; with ordinary flours the proportion of rice flour should be less ;

2. In addition to wheat flours very fine rice flour (usually not more than 5 per cent.) excellent bread is obtained in all respects ;

3. The flour of decorticated rice should be employed and not of rough rice which is unsuitable for breadmaking ; it is advisable to rule out the flour of rice which has undergone much manipulation ; no use should be made of the so-called 'glutinosa' exported rices (the product of the species *Oryza glutinosa*) which do not actually contain gluten, but are merely gluey or viscous in cooking.

A bread containing one third of rice flour and two thirds of wheat flour is as nutritious as pure wheat bread, has often superior qualities and does not require special care in the process of bread-making. (*Giornale di Riscultura*, Vercelli, 1931, No. 4).

PRESERVATION OF FLESHY FRUITS. — The *Journal of Agriculture of Victoria* (Vol. XXIX, Part 1) describes a simple and practical method of preserving fleshy fruits.

This fruits which are highly perishable arrive on the market simultaneously and as the production period is very short they disappear during the whole of the rest of the year. If it were possible to avoid market gluts by distributing the sale over the whole of the year, there would be a great increase in the consumption of these fruits. This has already been effected in the United States where storage plants are installed by means of which these products are on sale for the whole year.

The method of preservation advised which has given excellent results is a combination of the action of cold and of sugar. Unlike other fruits, pulpy fruits cannot be preserved merely by cold.

Alternate layers of fruit and sugar are placed in a container; the quantity of sugar employed being from 800 to 1000 g. per kilo of fruit; these containers, once filled, are stored at a temperature of 25 F., that is to say below the freezing point of the mixture. An essential precaution consists in using sugar which has previously been chilled, so as to avoid fermentation at the moment of placing in the container.

At the end of a certain period the sugar dissolves in the juice that exudes from the fruits, and the whole content of the container soon becomes a uniform mass of pulp having all the properties of fresh fruit: the sugar thus plays a double part: 1. it lowers the freezing point of the mixture; 2. it prevents fermentation.

The price of the storage, per kilo of pulp, is relatively cheap.

D. K.

ADVANTAGES OF THE PRESERVATION OF FRUITS BY THE VAPOUR OF ACETALDEHYDE — The February number 1931 of the *Journal of the Council for Scientific and Industrial Research* gives the results of experiments on this subject. It is clearly shown that fruits preserved in an atmosphere charged with vapours of acetaldehyde are preserved longer from attacks of mould than fruits preserved under ordinary conditions. It is also proved that the quantity of acetaldehyde necessary is quite small, on the other hand, if the concentration is too strong the appearance and the taste of the fruits may be seriously affected. This concentration depends on the variety of the fruits and on the storage temperature; consequently the process is not so far recommended for use on a commercial scale, as a more exact knowledge is required of the concentration which damage the fruit at any given temperature.

D. K.

UTILISATION OF THE FLAT SPARTO GRASS BASKET IN PRESSING OF OLIVE OILS. — Results of investigations carried out at the Tunis experimental oil factory (seasons 1929-31), with flat sparto grass baskets with rims and without central openings, show that a yield in oil is obtained at least equal to that obtained by the ordinary baskets. A noticeable reduction in costs of manufacture is also observed as a consequence of the increase in the output per hour, the reduction of the labour required for emptying the residues, and also owing to the lower cost price of the baskets. (Régence de Tunis, *Bulletin de la Direction Générale de l'Agriculture, du Commerce et de la Colonisation*, 1931, No. 144).

NEW TYPE OF REFRIGERATING PLANT FOR PERFUMERY. — In this plant which is the joint invention of M. ALMERAS (chemical engineer of the PATOU perfumery) and of the technical section of the « Société Nouvelle du Froid artificiel » valves and springs are eliminated. By its means the temperature can be lowered to about 10°C so as to remove waxes and terpenes, which tend to make the preparations rancid and disagreeable in odour. Filtering is carried out under pressure at an optimum temperature and impurities are completely eliminated thereby. This plant is fully described in *La Revue Générale du Froid et des Industries Frigorifiques*. (Paris 1930, No. 12, p. 287-289, 2 photo-graphs).

Industry of animal products.

FROZEN BEEF FROM HERDS WITH INFUSION OF ZEBU BLOOD IN QUEENSLAND. — This beef was sent to Smithfield and was pronounced on favourably by dealers at the time of its exposure for sale. (*Pastoral Review*, Melbourne, 1930, 16 September).

NEW APPARATUS FOR MECHANICAL PLUCKING FOR FOWLS. — In *La Vie agricole et rurale* (Paris 1931, N. 15) M. ARNAUD describes a new electric apparatus for mechanical plucking of fowls; it includes the starter, the electric fan and the equipment for bagging

and plucking. The bird is placed on a grating traversed by a blast from the fan. This current of air draws the feathers through the grating where they are caught by a series of cutters fixed on a drum passing between the grating and a kind of metal sheet. The plucked feathers are blown by the fan into a bag fixed on the opposite side of the apparatus. It is possible in this way to pluck 60 fowls per hour and a satisfactory separation of the different kinds of feathers can be effected. The effect of transport by means of a current of air is that the feathers are well dried and all tendency to fermentation disappears. A 2 HP motor is sufficient to start the apparatus.

VITAMINS A AND D IN CERTAIN FISH OILS. — A study of this question, made by E. M. NELSON and R. J. MANNING in the *Journal of Industrial and Engineering Chemistry*, Easton Pa., 1930) has revealed the following facts:

Tunny and sardine oils have the same content in vitamin D as cod liver oil

The oils of *Brevortia* and salmon also contain a large quantity. Salmon oil also contains as much vitamin A as the inferior qualities of medicinal cod liver oil

E. G. & G. S.

BOOK REVIEWS *

Tropical and Subtropical Crops.

SAUNDERS, A. R. *Maize in South Africa*, South African Agricultural Series, Vol. 7, 1930. Central New Agency Ltd. South Africa. 284 p., 72 illustr., bibl., index. Price £ 1.

[This work, especially written for South African conditions, treats the whole matter of maize growing from a practical point of view without however omitting scientific considerations which are necessary as a base for improving this important branch of African farming industry.

The contents are divided into 13 chapters. The first two give historical and statistical data which show the place of South African maize production in the total world production. The third and fourth chapters deal with the climate and botany of the maize plant respectively. The following three chapters deal with soils, manuring and cultivation and the eighth chapter with varieties and their adaptation to different parts of the country. The next two chapters are devoted to diseases and insect pests and the eleventh to inheritance, breeding and seed selection. The book is closed by a discussion on the various uses of maize and an exposé of commerce and commercial practice in South Africa].

M. B. S.

PHILLIPS, E. P. *An Introduction to the Study of the South African Grasses, with notes on their structure, distribution, cultivation, etc.* South African Agricultural Series, Vol. 6, 1931. Central New Agency Ltd. South Africa. 224 p., 121 plates and text figures. Index. Price £ 1. 5. 0.

[The author, well known for his ecological work on the grass lands of South and East Africa, has provided South Africa with a work of great value not only from a scientific standpoint but from a practical point of view as well.

After an introduction in which the botanic morphology of grasses is treated, a discussion is given of earlier publications and the history of genera with references to original descriptions.

More than 20 pages are given to the important question of migration and distribution and after a short survey of the tropical, subtropical and temperate elements in the South African grass flora a comprehensive ecological survey is given of the grass veld.

Besides these chapters, the most valuable part of the book is the key to the South African Genera and the Descriptions of the Genera. These make it possible also for the non-botanist farmer to get acquainted with the different grasses of his pasture. And ecological investigators may profit much from the experience gathered in this way by stockbreeders].

M. B. S.

* Under this heading short synopses are given of books sent for review.

MICHOTTE Félicien, *Agaves et Fourcroyas (Culture et Exploitation)*, Troisième édition revue et augmentée. Société d'Éditions Géographiques, Maritimes et Coloniales, Boulevard Saint-Germain, 184, Paris. Prix : 60 francs.

[A survey of the Agaves and Fourcroyas growing throughout the world. The botanic characteristics of each species are given and its country of origin, distribution and economic use. Interesting information is also given concerning cultivation and the industrial treatment of the products and the machinery used].

J. L.

Animal Husbandry.

STANG-WIRTH. *Tierheilkunde und Tierzucht*, Eine Enzyklopädie der praktischen Nutztierkunde, 6., 7. und 8. Band. Urban & Schwarzberg. Berlin-Wien 1929-1930.

[This encyclopaedia of veterinary science and animal husbandry is nearing completion. The last three volumes published (6, 7 and 8) contain articles by leading experts. Those concerning animal husbandry will be chiefly described here.

Volume 6 opens with a monograph on the *Rabbit* by H. NACHTSHEIM describing its origin, feeding, management and breeding and the rabbit breeding industry in Germany. Considerable space is devoted to the various breeds, as is also the case with the other domestic animals dealt with in the encyclopaedia. The number of rabbit breeds is large. The 'Reichsbewertungsbestimmungen für die Beurteilung der Kaninchen' (German rabbit judging regulations) mentioning 36 and new ones appearing nearly every year. The writer limits himself to describing in detail those bred in Germany. He adopts the system of classification in 6 groups used in the regulations mentioned above — groups 1 to 4 contain the large, medium, small and dwarf breeds respectively; group 5 contains the long-furred rabbits; group 6 the breeds with short fur lacking bristle.

In the same volume STEGMANN VON PRITZWALD describes stock breeding in Latvia and Lithuania, in a manner similar to that in which other countries have been treated in previous volumes.

Volume 7 contains a series of interesting monographs on stock breeding from a geographical standpoint, dealing with *Central America* (C. STANG) — *Mongolia* (R. RITTIG) — *Dutch East Indies* (J. MERKENS) — *the Netherlands* (C. STANG) — *North America* (O. BEDERKE) — *Norway* (PER TUFF) — *Austria* (H. PETER).

Volume 7 contains also a detailed article on the *Dairy cow testing associations*, by Prof. J. HANSEN, the leading authority on the subject; he describes the development, organisation and working methods of the associations, particularly in Germany, and shows the results obtained and their practical value.

Prof. MARTINY discusses *Milking machines*, the construction and working of the various systems, the rules which must be observed in machine milking and the technical and economic results obtained.

There is also an interesting article on *Fur farming* by STAKEMANN in volume 7. It may be doubted however whether his view of the future of German fur farming can be upheld in the face of recent economic developments. He considers that the success of the American farms warrants confidence in that of farms in the favourable climate of Germany if sufficient attention is paid to the quality of the animals.

Volume 8 contains monographs by U. DVERST on *Horses and Cattle* (zoological and historical aspects, and classification of breeds). V. STANG gives a study of *Horse and cattle breeds* according to geographical regions and countries.

In this volume Prof. KELLER discusses *Care of farm animals* and its influence on their condition and constitution. There can be little influence on hereditary constitution, but the writer considers that if the term 'constitution' be allowed to include resistance (hereditary and acquired) to adverse environmental conditions, the care taken of the animals may aid their development or, if exaggerated, may tend to lower their resistance and lead to degeneration.

H. KRAEMER and E. FEIGE contribute interesting articles on the *Concept of breed* and *Breed characteristics* respectively. These cannot here be analysed in detail but will be considered in a discussion of breed problems in a later number of the *Bulletin*.

Volume 8 also includes three monographs on the geographical aspects of farm animals: — *Poland, Rumania and Portugal*. Prof. STANG bases his discussion of stock breeding in Poland on the works of ROSTAFINSKI. The articles on Portugal and Rumania are by experts of each country, viz, JOSE MIRANDO DA VALE and G. K. CONSTANTINESCU, respectively. The former is of particular value as little had been previously published on stock breeding in Portugal].

I. — BROWN Sir Edward, *British Poultry Husbandry, its Evolution and History* Chapman & Hall, London 1930, 350 p., numerous figs.

II — JULL Morley A., *Poultry Husbandry*, Mac Graw-Hill Book Company Inc., New York and London 1930, 639 p., 229 figs., bibliography.

[The literature of poultry husbandry is keeping pace with the increasing importance of the industry in agriculture and in the general economy of countries. These two works represent the most recent publications on the development of poultry husbandry in Great Britain and the United States respectively.

BROWN follows the development of the industry in Great Britain from its beginnings to the present day and discusses its future prospects. JULL deals rather with its present state and the problems of the day.

The two books are complementary also in other particulars. BROWN, for example, describes the present situation from a practical standpoint, the introduction of standards, fattening, natural and artificial incubation, etc., but deals only cursorily with selection, whereas JULL treats the scientific aspects of modern poultry breeding exhaustively; he describes the anatomy of the hen, the formation of the egg, the theories of heredity and, before passing to poultry feeding practice, discusses theories of alimentation in general, requirements of nutritive principles and metabolism.

Both writers give much attention to breeds, selection according to standards and the qualities of breeds. BROWN deals with all domestic fowls, but JULL only with hens. Both consider foreign as well as native breeds, but each exclusively from the point of view of his own country.

BROWN discusses at length the influence of shows on the development of the poultry industry. He considers that they are responsible for the introduction and spread of new breeds, whether foreign or home produced. In this connexion he deals with judging systems and emphasises the differences between the American and British systems. In Great Britain more dependence is placed on the eye than on the pencil and printed tables. JULL explains the American systems in detail, particularly that of the American Poultry Association, and shows the relationships which have been found to exist between physiological and morphological characteristics on the one hand and egg production on the other.

Both writers discuss marketing problems and JULL devotes a chapter to the utilisation of by-products, such as feathers, manure, accidentally killed birds, eggshells, etc.

JULL gives also a long list of publications in various languages on poultry husbandry].

S. T.

FORESTRY

The Future of Subsidiary Fuels of Vegetable Origin.

The increasing world consumption of petrol is beginning to cause anxiety in those Countries which are importers of this valuable form of fuel. This anxiety is in the first place due to the laws governing the market. The inequality in the distribution of the raw materials supplied by natural formations causes the exports to be continuous and also on an increasing scale, until doubts begin to arise as to the true capacity of the original sources. Interruptions in the normal supplies, which may arise for important historical reasons or as a result of a falling off in consumption, although merely passing phases, are the cause of a certain strain on the importing countries, even though recovery follows as a rule readily enough. In any case sooner or later monopoly conditions begin to become established in the exporting countries, when the amount of the exports of these products is on so large a scale, as compared with the estimated capacity of the source, as to imperil the possibilities of satisfying their own domestic and military requirements.

At the present time fuels of all kinds are such essential elements in all modern life that no Government can possibly be indifferent to the question. Any kind of limitation on production, and therefore on the export trade in petrol, might conceiv-

ably have almost incalculable effects and it is necessary to give timely consideration to all possible remedial expedients and to take advantage of all home resources that are potentially available.

At the moment the general view is that the adoption of subsidiary fuels by the countries that are importers of petrol could only have the effect, even in the most favourable conditions, of stabilising the importation of petrol. The production and marketing of petrol are at the present time so well organised on the technical and financial sides that it is possible to keep up prices even when in competition with many excellent subsidiary fuels. On the other hand should the exporting countries establish a monopoly, it is possible that their privileged position as regards prices might be weakened.

No one however is at present in a position to form any true estimate of this possibility, though experts are agreed that, if in the meantime the methods for producing satisfactory subsidiary fuels at cheap rates in the importing countries are properly developed, these countries will be more favourably situated than at present, should any emergency arise and a step in advance will be made towards hastening the time when they will enjoy complete freedom as regards importations.

The struggle has in fact already begun and there are no longer so many technical difficulties in the way of better prospects for the more important subsidiary fuels, although the industrial processes used in their production, which theoretically at any rate give quite good results, cannot as yet be worked sufficiently cheaply to justify any universal application such as might be called for by the necessities of the case.

Again, if the question of the production of national subsidiary fuels is considered from a wider standpoint than that of market prices, there are in a number of countries, various indirect reasons of considerable moment to justify its encouragement, such as, for example, the utilisation for profit of raw materials at present quite neglected, resulting in an increase in home production, and also — this latter being a matter of capital importance — the timely provision, by means of plants that can be extended to meet emergencies, of subsidiary fuels for national protection at times when the importation of petrol may become a matter of special difficulty. In certain cases the production of national fuels on a large scale may go far to facilitate a systematic distribution of labour force, by providing employment in areas where industrialisation has not made much progress, while at the same time encouraging the marketing of certain agricultural products which are by no means easy to preserve and of which the normal use is gradually being replaced by substitutes. In conclusion it may also be said that any clear assurance that definite steps would be taken to bring about a progressive increase in the output of products which would in their turn be consumed regularly and in large quantities might attract capital for investment in the various industries connected with subsidiary fuels.

Such considerations have for some time past influenced experts and Governments to attempt to discover some satisfactory scheme but so far it has not been easy to achieve any definite result. The case of national fuels seems to be on all fours with similar proposals, involving wide technical and financial issues; at once questions of method and custom and the reaction of vested interests come into play and have the effect of postponing any solution by agreement.

From the first, on perfectly reasonable but possibly too general grounds, opinion has been overwhelmingly in favour of using liquid forms of subsidiary fuels, because of their applicability to every kind of motor used in any sort of motor trac-

tion work. Moreover, as regards sales, there is great reluctance to upset the customary usages of the consumers and to adopt fuels which would require the constructional adaptation of the engines and carburettors. The idea of liquid fuels was likewise closely connected with the desire to be able to find a substitute for petrol in the event of any check or stoppage in the export trade, assuming uniformity of requirements.

It is more than possible that there will be an increase in the use of motor traction and hence fuels, similar to petrol both in methods of employment and output, cannot fail to be of service, and, basing calculations on existing plants, there was every reason to anticipate further development. In the production of subsidiary fuels good results were also expected from the utilisation of various forms of industrial waste products, more particulars of agricultural products. From this point of view the earliest proposed solutions in many petrol importing countries were as a rule based on the use of ordinary spirit as the typical form of fuel. The highest hopes have been founded on the development of the distillation industries, working on the most varied kinds of waste material and in some quarters one went so far as to anticipate a time when large quantities of crops would be grown for this special purpose and thus there would be brought about a combination of interests which would simultaneously be to the advantage of the agriculturist and of the distiller.

In actual practice ordinary spirit proved quite serviceable, though it was seen to possess the drawback of not mixing well under compression in the engine with consequential "knocking", to use the slang of the craft. This defect could however be readily made good by an admixture of chemical substances. Despite its good working capacity ordinary spirit did not prove popular with the great mass of consumers. The price of the new fuel was not low enough to make competition effective. The distillation material was not as plentiful on the markets as had been anticipated and its price was liable to fluctuations and frequently too high for the distilling factories. Moreover the cost of collecting the material, which in itself was quite cheap, went far to nullify the original advantage. At the same time there was a fall in the price of petrol so that there were no means of determining the cost of an extensive test with ordinary spirit. Consumers also, when they found that the supply arrangements were far inferior to the excellent system already in force for petrol, gradually lost interest in the new substitute.

Despite the comparative failure of this first attempt, expert opinion remains convinced that spirit, particularly if of high grade, can alone prove any serious competitor to imported petrol.

Attention and interest are now mainly concentrated on the development of the manufacture of synthetic alcohols, some of which are already being used with good results for industrial purposes in certain countries.

The production of synthetic methyl alcohol on an industrial scale is now being considerably developed and it has already been proved that, by a combination of this form of alcohol with other substances having a higher boiling point, it is possible to obtain satisfactory fuels. When the production of synthetic ethyl alcohol really becomes a definite industrial proposition, which, judging by the experimental work now in progress, is likely to take place at an early date, a new and important source of subsidiary fuels will be provided which should go far to bring about a partial emancipation from complete dependence on imported petrol. Careful studies of the methods of the synthetic production of high grade spirit (propyllic, butylic, amyllic, etc.) justify the expectation that it will be found possible to manufacture them at an economic rate and, when these superior types of spirit enter the field, there is likely to be a falling off in the use of lower qualities and thus, as regards

quality, there will be set up a healthy competition which will be always be a determining factor in large scale competition.

DE CAPITANI, the Italian expert, states that a subsidiary fuel should possess the following properties: (1) a sufficient degree of volatility, to facilitate starting while avoiding autocombustion or excessive vaporisation — (2) it must not produce residues which may effect or foul the mechanism — (3) in the case of a mixture it must be capable of retaining its original condition for a long period even under changes in temperature; in addition the mixture must be able to maintain its condition even in presence of a small degree of moisture — (4) the fuel must mix perfectly with the air added for combustion.

Meantime it is generally recognised that acetone can be a valuable source of supply of potent liquid fuels. The distillation of wood in retorts provides a fair quantity of basic pyrolignite, from which by further distillation, acetone is obtained and the stage in the process of distillation, at which acetone is liberated, provides the opportunity for converting it into satisfactory fuels of various grades. "Perpritz", which is a hydrogenated by-product of acetone, is now being manufactured in France as also "Ketol", which is the result of a special combination of butylic alcohol with other types and high grade aldehydes.

Another process of which the details have now been fully worked out is that for the production of high grade spirit of the butylic type in combination with acetone, by means of a fermentation of sugar substances induced by a bacterium known as *Bacterium acetone-butylicum*.

The French authority, MATIGNON, states that methods of saccharifying sawdust are not only being studied but also receiving practical application. Experiments made in Belgium at Campine have resulted in the production of 25 litres of spirit by the treatment of 100 kg. of sawdust.

Castor oil, after the second and third pressing and when mixed with spirit or petrol, also gives a good liquid fuel, while it will be remembered that palm and cabbage palm oils have been already largely used as fuels and lubricants in tropical countries. Prof. MAHIE, by employing a process of distillation in presence of catalysing agents, was able to obtain from palm oils, gases with high heating capacity and a liquid fuel which he calls *vegetable petrol*. The MAHIE process has also proved successful when applied to olive oil.

DE CAPITANI also calls attention to the potential fuel values of many kinds of waste products in industrial factories, calling special attention to the potential source of good quality fuels to be found in the gummy refuse of the material used in rubber factories.

The employment of liquid fuels of mineral origin in place of petrol, as is largely the case in Diesel and similar motors, has now become very general. Where these fuels are available in a country in any considerable quantities, supplies of petrol are also as a rule similarly available and the subsidiary fuels have already firmly established their own special market and are in importing countries the chief competitors of petrol. A number of countries however find themselves bound, in order to get fair play for their new national fuels, to oppose the importation of heavy oils for fuel purposes. In England at the present time a general scheme is under consideration based on the utilisation of coal for the extraction of petrol on industrial lines, whereby it is hoped to make the country completely independent of fuels imported from abroad. In addition R. PAWLIKOWSKI has shown that Diesel motors can be worked by solid fuels in powder form.

In France the product known as "Catalex" is a good example of an industrial mineral oil and, when used in a suitable type of carburettor, it has given good

results in heavy traction tests. Other fuels of vegetable origin are used in mixtures and have proved satisfactory.

Among the raw materials, from which efficient liquid fuels can be obtained and closely connected with forest products, reference may be made to pyrolignite resulting from wood distillation. Up to the present it is not anticipated that pyrolignite will be used to any large extent in the production of fuels. Inasmuch however as this fuel is of quite good quality and the wood distillation factories have an almost unlimited supply of raw material to work on, it is quite possible that in the future, having regard to these favourable conditions it will come into more general use. Wood distillation on an industrial scale has already been considerably developed in Northern Europe and is being established in America and it is well known that a number of valuable products can be obtained by this method. Some of them are however threatened by the competition of the parallel process of synthetic production. On the other hand the necessity that the various industries should continue to receive their supplies of certain products of distillation, which are not and probably never will be manufactured synthetically and, in addition and even more important, the necessity felt by some countries to take every opportunity to assist in the process of putting forest production on a sound basis by securing for it remunerative and regular outlets, will tend, it is believed, to encourage wood distillation. It may further be noted that in this way the less valuable varieties can be utilised to advantage.

To sum up, in the normal conditions prevailing to-day in petrol importing countries it may be stated that a reduction or stabilisation of the imports of petrol can be obtained to a large degree as regards liquid fuels by the production of high grade all purposes and standardised spirit suitable for large scale marketing and derived from a variety of sources.

While awaiting progress in technique and its translation into practical industrial methods, the problem of the supply of subsidiary fuels has been solved by analysing it and considering the various requirements of practical kinds of traction and the possibility of adapting these fuels thereto. In this connection special attention has been paid to heavy and relatively slow transport. This particular form of transport is making conspicuous progress in all parts of the world and in some places it is now so highly developed that it has become an active rival of railway transport. Its place in heavy military transport is continually assuming greater importance and it is gradually beginning to take the place of all other forms of traction in farm work. Hence motor transport and tractors have become a highly important factor in the question of petrol imports and the position is aggravated by the fact that it is uneconomically used. Owing to lack of care in upkeep and maintenance, which is particularly serious in the case of hard worked motors, camions and tractors soon become excessively heavy consumers of fuel and fully deserve their title of "petrol swallowers". For these reasons the discovery of a fuel much less expensive than petrol for heavy transport motors is considered in the petrol importing countries as a matter of the utmost urgency and closely connected with the whole question of the development of this class of traction and transport.

Among the various fuels which have so far been tested, the gas derived from wood distillation, now known as "forest gas", has proved by far the most economical. The distillation process takes place in small gas generators carried on the vehicle.

Scientific knowledge of combustion processes has made great progress since the beginning of the present century but, unfortunately, some of the chief principles of this science are as yet but little known and applied in practice. In highly

industrialised countries there are special committees and societies for combustion and smoke control which have for a long time done much to encourage improved methods in the use of fuels. These societies have paid special attention to the best ways of utilising mineral fuels and certain improvements have been suggested. Their work moreover covers all kinds of fuels, they possess up to date statistics and data on all questions of combustion and their service is becoming of increasing value, especially in countries which are poorly supplied with mineral fuels.

It may well be that at no distant date, as a result of the introduction of improved methods of combustion, the dense clouds of smoke that arise from factory chimney stacks will no longer be seen in the sky even in those countries which are rich in mineral fuels.

The adoption of gas generators has shown how many mistakes have been made owing to an unscientific use of fuels. If an estimate could be made of the amount of power wasted in the past and still being wasted to-day the figures would be staggering.

The earlier types of gas making plants introduced for industrial purposes were fixed ovens for the utilisation of the fumes. These fixed plants recover the heat given off by the fuel in the furnace and make use of it for breaking up into their simple elements the volatisable products of combustion. By adding suitable quantities of O and H to these elements at appropriate temperatures and times fully combustible gases are obtained. Fixed gas producing plants, using any kind of fuel, are built in fire-brick and work at high temperature and continuously if a constant supply is required. Stoking-up is a matter of several days.

The necessity for utilising particular substances with a high carbon content in certain special processes as well as practical considerations have brought about the construction of gas producers with an alternating action and capable of functioning at different temperatures, this type being particularly well adapted for employing heavy oils.

The idea of using gas generators for the motors of autovehicles would appear to have had its origin in France. In Italy Engineer GARUFFA in 1900 was the pioneer of experimental work in the use of gas generators for the supply of fuel to motor engines and his experiments were later further developed by Engineer DE ANDREIS.

The small gas generators used in heavy motor transport represent an ingenious adaptation of the ordinary gas producing plants. Several types are in use and constant efforts are being made in the direction of simplification. Heavy oil fuels may be used, but expert opinion, particularly in countries which are well supplied with wood, is now mainly in favour of small generators, utilising wood or vegetable charcoal, either pure or mixed with coal. The requirements of these gas generators are well met by the employment of light wood charcoals as fuel. The fuel supply must be of such a kind and form as can pass regularly and continuously to the grid and in such a way as not to prevent the free normal passage of the gas — a matter of great importance in the case of generators which are affected by the vibrations of transport.

As it is necessary that the apparatus for gas compression should be of minimum dimensions, the moisture content of the materials used for gas extraction must not transcend certain fixed maximum limits.

Carbon and moisture content is a very important element in this connection, as substances with a low carbon or high moisture content would imply carrying a heavy dead weight. Other questions to be considered are the content and absence

of dust in order to avoid the necessity for cumbrous apparatus and complicated processes.

Moreover the highly controversial point of the "reactivity" of the various substances used for gas production must be taken into account. M. ERCULISSE of Belgium gives a very clear definition of this quality in the following terms: "in a given number of kinds of fuel the one that is the most effective and the best reagent is that which at a given temperature causes the most rapid "reaction" by means of a specific gas in the presence of carbonic acid and superheated steam".

Ash residue is also a matter of some importance. The manufacturers of small gas generators suitable for motor traction purposes are rightly concerned with the question of economic results and make every effort to obtain a maximum gas yield combined with a high degree of purity. Experience however shows that it may be preferable to make some slight sacrifice as regards yield in favour of simplification in structure, always of course paying due regard to the requirements of carburisation.

In the consideration of technical improvements the, special requirements of practical motor traction have been somewhat left out of sight; in this case simplicity of construction, solidity and easy handling are of even greater importance than absolute yield.

DE CAPITANI declares that complicated generators producing a gas mixed with steam, with direct draught and special apparatus for purifying the gas, may be considered as obsolete for practical use on a large scale. Generators with reversed combustion, burning tarry substances in place of eliminating them by moisture, are increasingly showing their superiority. The gas is chilled by light apparatus utilising the draught caused by the movement of the vehicle. It is a considerable advantage that the generators can be refilled without halting on the road. Constant improvements are being brought about in lighting up, starting, protection against loss of heat by radiation, etc.

Experts and the chief motor building firms are agreed that in order to obtain a satisfactory and steady yield from these generators, the motors themselves should be adapted to the system. The adoption of this principle might also serve a very useful purpose by encouraging the production of fixed types of fuels for gas making. In the meantime and by way of compromise a type of apparatus has been devised, which allows a carburant to be used obtained by the distillation of solid fuels in motors ordinarily supplied with petrol.

If the idea of full returns from the substances used for gas production in small generators be partially given up, some compensation may be found in the prices to be paid for them.

In countries where rapid progress is being made with the discovery of national subsidiary fuels, there will be found certain tendencies and preferences favourable to the use of the fuels which are the best known and have a fairly established market. The explanation can readily be found in vested interests but it is unlikely that these interests will be able to maintain their position in the future.

As regards solid fuels the case is similar to that of the liquid and with the process of time the fuel which, the essential qualities being equal, is the less costly will win the preference. Experiments have been in motor traction working on producer gas, sometimes in connection with the public services, with various types of solid fuels, including wood, wood charcoal, mixtures of vegetable charcoal and coal, ordinary coal, peat, coke, lignite, etc. The generators using wood are increasingly losing ground as compared with those that are supplied with more concentrated

ed fuels. In practice the moisture content in wood is too variable a quantity for it to be used in plants of which the requirements are clearly determined. At the same time there can be no doubt that wood is so convenient a material that it is quite possible to foresee its return to favour if a maximum limit for moisture content could be established for wood sold for purposes of gas production.

Wood charcoal is excellently adapted to the necessities of gas generators used in motor tractors. MM. DUPONT and ALLARD of France have shown that "brown" or incompletely carbonised coal is particularly suitable for the generation of gas. The high carbon content of wood charcoal, its general lightness, regular yield, the ease with which it releases gas and its active and reactive properties are qualities which are not found in such excellent combination in the other substances employed for gas production.

The results of the experiments made up to the present time show that the kind of wood from which the charcoal is made is not a matter of special importance. For the time being there is a preference for soft, light woods which seem to be the best adapted for the particular purpose in view. Moreover there are other minor requirements to be satisfied which are not without importance. The charcoal should be sold in small pieces, as far as possible be dust free and at the same time dry. It is further desirable — and herein the question of the interest of the merchants also comes in — that the charcoal should be put on the market in strong paper bags in sizes corresponding to the normal charge of a producer. A further advantage of this method of packing is that the charcoal is kept dry and retains its active properties.

The required dimensions, 15×25 mm., are small and it is not likely that for the present they will be modified as they are the result of long experience of gas producing work and it has been found in practice that any deviation has always had serious consequences. The point of size can be readily met by increased attention to the use of suitable material for conversion into charcoal for gas making, employing for the purpose to a larger extent than in the past all the small branches and waste resulting from forest felling.

It is generally recognised as a principle of forest preservation that the presence of small branches and refuse on cut over areas involves considerable risk, since such refuse can readily become a focus for forest fires and is always favourable to the inroads of insect pests and to the production of fungus growths. Contracts controlled by the forest authorities nearly always contain a clause whereby when felling takes place, the parties are required to clear up the felled area and to remove all waste. In practice it is not always possible to comply with this rule and in any case it involves considerable cost. Thus the production of charcoal for gas making would tend to relieve this burden and it should always be borne in mind that wood charcoal hitherto considered to be of little account as a fuel, is now highly esteemed for gas making.

In certain countries, where the market for charcoal is suffering temporary eclipse, the question has been raised whether an increase in the production of gas charcoal is really desirable.

Speaking in quite general terms, it may be said that any increase in the production of charcoal fuels might always be considered as in itself desirable and more especially if such increase comes about through the use of materials which have hitherto been employed at all. Herein may always be found a fresh source of profit and, in certain conditions, this new form of production may be able to retain workers in certain districts who otherwise might have been forced to leave owing to unemployment.

As regards the possibility of any competition with ordinary charcoal production, there does not appear to be any reason for alarm, inasmuch as gas charcoal will never be used as a substitute for ordinary charcoal for the purposes for which the latter is usually employed.

Moreover it should be borne in mind that, if the trade in vegetable charcoal has managed to withstand and overcome the difficulties that have been gradually brought about owing to the use of substitutes, there is no reason to be unduly disturbed at temporary periods of crisis which can be met by a wise shortening of production. It may even be stated with good reason that the introduction on the markets of a type of charcoal that may command a large and gradually increasing sale might have the effect of preventing crises in the future.

There is no reason why vegetable charcoal of the kind that can be used for gas production should not pass under that category. It can also be well understood that it is greatly to the interest of the producers of charcoal to assist in the rapid realisation of the desires of scientists and economists, who are most anxious to bring about the determination of fixed types of national subsidiary fuels.

Fuel blocks made of wood charcoal, either pure or mixed, might well absorb all the residues of ordinary charcoal manufacture, including a considerable part of the ordinary saleable production, leaving out of account good class small charcoal. The determination of a particular type of block fuel really satisfying the requirements of gas production is by no means an easy matter, for, apart from the question of the solidity of the blocks, the substances that enter into their composition must retain unimpaired their full properties of re-activity. This problem is now being carefully studied but up to present those competent to judge do not find that in practice any really satisfactory solution has as yet been found.

(to be continued).

S. CABIANCA.

Notices.

UNION OF THE FOREST FIRES INSURANCE SOCIETIES IN THE FOUR NORTHERN COUNTRIES. — During the course of the first Congress of the Northern Countries on Forest Fires, there was a meeting of representatives of the Forest Fires Insurance Societies of Norway, Sweden, Denmark and Finland. According to an article by Mr. H. I. BALDWIN, entitled the "*Scandinavian Union of the Forest Fires Assurance Societies*" and published in the *Journal of Forestry* (Washington D. C., 1931, No. 1), the object of the Union will be the collection of statistics and information, having reference to the protection and insurance of forests against fires, for the purposes of the member Societies and at a later stage the drafting of uniform rules for compensation benefits. An executive Committee was appointed consisting of the Directors of the *Norwegian Mutual Forest Fires Insurance Society*, the *Swedish Forest Insurance Society* known as the "*Veritas*", the *Danish Insurance Society for Plantations on Dune Lands* and the *Mutual Society of Forest Owners in Finland for Forest Fires Insurance*. The next Congress will take place in Finland in 1932.

During the last 4 years forest fire insurance work has made rapid strides in these Northern Countries. In Denmark up to the present 40,000 hectares of plantations are insured for 16 million kronen by the Danish Society, which began its work in 1898. In Sweden between 70 and 75 thousand owners of forest lands have insured 8 million hectares for about 8000 million kronen and these owners include a number of important societies, trading in timber and paper. In this country a number of insurance Societies accept forest risks. In Norway the Norway Mutual Forest Insurance Society, which was founded in 1912, has about 15,000 members, their combined policies covering an area of 2 million hectares for a value of 400 million kronen. In Finland the "*Sampo*" Mutual Insurance Society was founded in 1914 and the "*Owners Mutual*" two years later. The two Societies together have about 30,000 owners on their books, the area covered by their policies is about 2 million hectares and the value of the insurances effected is estimated to be in the neighbourhood of 3 million Finnish marks. R. W.

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OF

AGRICULTURAL SCIENCE AND PRACTICE

GENERAL AGRONOMY AND CROPS OF TEMPERATE REGIONS

Report on the experiments of the first four years of the Cerignola Arid-Agricultural Station (Part I).

The Arid-Agricultural Experiment Station at Cerignola (Apulia, Italy) was established in 1925 by the Permanent Wheat Committee as an annexe to the Crop Laboratory of the Royal Higher Institute of Agriculture at Portici.

The experiments which have been carried out under the direction of the writer and with the collaboration of Profs. PANTANELLI, G. ROSSI, SANTINI, LEGGIERI and Drs. CANDURA, CARETTO, CONTI, MASCIAN, ROMEO and VIGGIANI are principally concerned with tillage and crop rotation and to a minor extent with wheat varieties, fertilisers, etc.

The influence of farming technique in increasing wheat yields in an arid climate — the chief purpose of the Cerignola Station — is considered also in relation to the meteorological factors of each year and to the variations in the physical, chemical and biological conditions of the soil.

The results here summarised must be regarded as a whole and as having value only as indications of tendencies which can be affirmed only in the future ; considering the brevity of the period from which the results are drawn, this will be obvious to those familiar with agricultural research.

The Experiment Station comprises 59.17 hectares of loamy soil, very uniform in constitution and structure, flat, with an even surface and very gentle slopes.

The soil is alluvial in origin and may from a stratigraphical point of view be divided into two parts — the north-west part of the Station has a deep soil of about 1.57 metres, the other part, to the south-east, has a limited layer varying between 14 and 60 cm. In the latter part formations similar to hardpan ("escotone") lie over the subsoil proper.

The plan of experiments had for basis the endeavour to find both an improved tillage system for the hot, dry climate of Southern Italy (the factors included in the system are the implements and their use, depth of tillage and time of tillage) and the crop rotations most favourable to wheat production.

In the evaluation of the yield data indices were substituted for the figures of absolute yield so as better to throw into relief the differences in the yield of different plots.

In the tillage experiments (series I) 36 different combinations of tillage operations were tested on 36 plots of a hectare each. The experiments may be grouped as follows:—

- (1) exclusive use of seed-tripping machinery, specially ploughs;
- (2) exclusive use of mowing machinery: disc harrow (with or without subsoiler), disc plough, rotary tiller, sub-soiler.

(3) use of more than one type of machine : summer working with mellowing implements and autumn ploughing and *vice versa*.

Certain plots received no summer tillage.

For the main ploughing (in autumn) depths of 20, 25 and 30 cm. were tested. In summer the depths were always 10-12 cm.

The crops in the plots of series L, were:—

1926-27, Roman horse beans for seed, manured with 50 quintals of olive residues and 4 quintals of superphosphate per ha. ;

1927-28, each plot was divided longitudinally into two parts and planted with the soft wheats ' Bianchetta ' and ' Mentana '. Half of each wheat in each plot received 1 quintal of ammonium nitrate per ha. ;

1928-29, the plots were divided transversely into two and one half left fallow and the other half put down to meadow of vetch and oats, the whole being fertilised with 6 quintals of superphosphate per ha. ;

1929-30, all plots were sown with ' Senatore Cappelli ' wheat and fertilised with 1 quintal of ammonium sulphate at time of seeding and 1.5 quintals of ammonium nitrate as a mulch.

The following rotations were tried out in the 25 half-hectare plots of series R :

- (a) 3 year cycle : fallow — wheat — oats.
- (b) 3 " " meadow — wheat — oats.
- (c) 3 " " beans — wheat — oats.
- (d) 4 " " beans — wheat — meadow — oats.
- (e) 8 " " rest — rest — rest — rest — wheat — beans — wheat — oats.
- (f) no rotation : lucerne.

In the period 1926-30 the experimental fields received an average of 601.96 mm. of rainfall, with a difference of 405.55 mm between the year of maximum (1929-30) and that of minimum rainfall (1926-27). The bulk of the rain fell in autumn, winter and early spring.

The hottest month is August, with a mean daily temperature of 24.63°C. ; the coldest is January, with a mean daily temperature of 6.19°C.

From 1927 the temperature of the soil was measured at the surface and at depths of 3—5—10—25—50—100 cm. The temperatures of the surface layers down to 25 cm. differed little from each other and from the air temperature. The daily oscillations diminished with increasing depth. Rain has a levelling action, specially on the temperatures of the layers down to a depth of 50 cm.

Machines. — The experiments with different tillage machines (sod turning and soil mellowing) were supplemented by a comparative dynamic study, using a transverse profilometer to measure the volume of the soil tilled, a dynamographic trolley to record the average traction force required by the implements and a rotation dynamometer to measure the mechanical work utilised by the rotatory organ of the *Subsoiler*.

The tests gave the following results with regard to the energy expenditure required by the different types of machine :—

The *sub-soiler* and *disc* ploughs require least energy ; the *sub-soiler* 1 ½ times less than the *rotary* tiller double.

The higher expenditure of the Canadian spring-toothed cultivator in comparison with the *rotary* tiller is shown by the fact that the former must pass 3 times over the same furrow to reach the depth attained by the latter in one passage.

The traction force utilised by the DEL PELO PARDI rake is extremely low, although its working is deep.

The mechanical work absorbed by the rotary tiller is considerably less when the machine travels at a higher speed.

Soil structure. — A gradual improvement is effected by tillage with implements turning the sod to depths of 20 and 25 cm. and by the crop remains left in the soil.

Surface tillage in summer in conjunction with deep ploughing (25-30 cm.) in autumn allow of an easier ploughing under of stubble and weeds than autumn ploughing to 20 cm. alone. The latter leaves part on the surface so that even after a year it is not decomposed.

Soil under meadow preserves a better structure than fallow.

Land tilled only in autumn with sod-turning implements is defective on account of excessive clods.

Tillage with mellowing implements in time makes the structure of the deepest layers of soil worse, but this result is less marked when discs are used than with the SIEMENS rotary tiller, the flexible-toothed cultivator and the simple sub-soiler.

Tillage with mellowing implements before the summer has no influence on soil structure.

The structure of fallow repeatedly harrowed deteriorates.

The light tilth produced by the rotary tiller is readily lost and then the soil becomes greatly hardened.

Stubble, etc. is incorporated with difficulty.

The mixed system of tillage combines the good and bad qualities of the different systems composing it.

The DEL PELO PARDI system gives a better structure than the other systems tested.

A study of the influence of tillage methods on porosity showed that careful tillage in autumn increased porosity, whereas tillage before the summer and the nature of the implements had no effect.

Land under meadow acquires and preserves better porosity than when left fallow.

The original lumpy structure of the soil at the Station was preserved best by the sub-soiler, while other systems tended to break down the lumps and give a finer texture to the depth of the tilth. The plough in particular had this action on the surface layer, while the minimum effect was obtained with discs; in the underlying layer maximum disintegration was obtained with discs and minimum with the rotary tiller.

Tillage before summer had a disintegrating action on the soil lumps, the disc harrow having such an effect to the most and the plough to the least extent. The lumps are preserved best in land not tilled before the summer.

Lying fallow tends to make soil texture finer than meadowland. The cultivation of cereals also has a pulverising effect.

A comparison of the three systems of autumn tillage does not show that rotary tillage has any more pulverising action than the plough and disc implements.

The soil has always a tendency to return to a texture of equilibrium which it seems depends not only on tillage but also on other factors the total action of which has more influence than tillage.

Soil organic matter. — It has been seen that the organic matter content of the soil tends, with monthly oscillations of varying extent, to remain constant.

pendently of crop rotations and organic or inorganic fertilising. This applies to the two layers studied, from 0-30 and from 40-50 cm.

In the monthly variations in organic matter there is a certain parallelism between the surface and deeper layers, though in the latter the variations are usually more sudden.

In general the organic matter increases from December to July and diminishes from July to December.

It would appear that non-cultivated meadow has a higher proportion of humus in the surface layers but not below; that fallow retains a high proportion in both the surface and deeper layers; that the cultivation of wheat and oats does not sensibly diminish the humus content; that at the end of a year the residues left by meadow or beans dressed with farmyard manure are already exhausted.

In the rotation plots an increase of skeleton was found in the soil, due to tillage reaching the subsoil and raising fragments of 'crostone' and alluvial pebbles. Tillage and cereal cultivation tend to pulverise the soil while the culture of leguminous crops and rest have the opposite effect.

Soil reaction changed from subalkaline to neutral or subacid.

The organic matter increased with the cultivation of lucerne, with the application of farmyard manure and with a period of rest. There is consumption of organic matter in non-manured rotations, particularly with the cultivation of cereals, while with annual leguminous crops, non-manured, the proportion of humus remains constant or in certain cases increases slightly.

The lime content diminishes in most plots even when they have received basic slag, superphosphates, calcium cyanamide or gypsum in quantities not excluding leaching.

With regard to variations in the nitrogen content, under lucerne a slow increase was found and frequently also after beans which have received fertiliser. Nitrogen losses were found not only in cereal cultivation but also in bare fallow and were so pronounced that there is no room for doubt about the importance of leaching.

Except for irregular oscillations the total P_2O_5 content remains constant, while the available P_2O_5 tends to increase by the application of fertiliser and by the solvent action of roots.

Potash increased in some plots by reason of the addition of fertiliser and by biological activity, while in others it diminished by consumption and leaching.

Relationship between tillage and the bacterial flora. — By a comparison of cultivated land left untouched for three years with the plots tilled in various ways but cultivated in the same manner, the following observations were made. Unfavourable weather conditions seem to influence the numerical development of soil bacteria; the absolute total number of bacteria varies little between the experimental and control plots; the anabolic bacteria (nitrifying and nitrogen fixing) are present in the soil in greater numbers than the katabolic (putrefying and denitrifying); nitrification seems, to judge from the number of nitrifying bacteria, to be more favoured by tillage with soil-turning machines than with mellowing machines or with sward methods, but the digging under of stubble and weeds neutralises this effect, apparently reducing nitrification below that of the controls; and, in the case of lucerne, and in nitrogen fixing the action of ploughing was found to be more favourable than that of a 12, while in putrefaction alone it was little favourable.

Humus of the soil. — Periodical determinations have given the following results. The humus content in the soil at harvesting of the crop (residual

humidity) is inversely proportional to the vegetative development of the crop, whereas there is no evident relationship between the residual humidity of the soil and the yield in grain of the crop; there seems to be no relationship between the quantity of rainfall during the year and the residual humidity, though, as might be expected, the rain fallen during the period immediately preceding the test may exert an influence; rain falling during summer after the harvest tends in general to diminish losses of soil moisture much more strongly in the surface layers (from 0 to 30 cm.) than in the layers at a depth of from 40 to 50 cm. Different tillage methods were not found to exert any specific action with regard to soil moisture.

(To be continued).

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TROPICAL AND SUBTROPICAL AGRICULTURE

Tung oil: a new plantation crop.

Commercial importance (7). — This oil was first introduced on a commercial scale from China into the Western world under the name of Chinese Wood Oil, over 30 years ago and reached its greatest development during the war, when it was an essential ingredient of airplane paints and varnishes. Today it forms one of the most important export products of China. As all countries for their supply are dependent upon China there is a strong competition for this oil and the price has been maintained at a high level, notwithstanding the quality offered often being poor and sometimes adulterated.

Its unique properties as a drying oil render it indispensable for certain types of varnish in which tough water-resistant films of high gloss are desired. It is now also widely used as an ingredient of certain types of paint media and in the manufacture of electrical insulating varnishes. Other industries are also interested, for example, the linoleum industry.

The exports from China and their destinations are given in the following table.

Exported to:	Tons of 1016 kg.					Value in 1000 £.				
	1924	1925	1926	1927	1928	1924	1925	1926	1927	1928
U. S. A.	37 324	42 029	32 144	34 066	44 062	2 339	2 438	1 705	2 093	2 572
Hongkong	4 402	1 728	3 136	7 957	8 252	183	71	129	226	299
Great Britain	3 179	2 297	2 896	2 660	5 945	196	129	157	161	321
Germany	4 719	3 773	3 733	3 328	2 553	291	215	143	126	128
Holland	474	619	927	3 423	1 537	39	36	50	237	38
France	378	347	1 133	815	1 024	60	47	65	49	55
Japan	708	333	457	391	473	44	19	24	23	25
Italy	365	236	225	327	835	23	15	12	30	13
Denmark	243	154	144	202	333	15	9	3	13	13
Belgium	157	180	196	205	136	10	9	11	12	7
Other countries	733	933	427	363	437	43	57	21	21	27
Total	52 346	53 219	44 385	53 643	65 137	3 242	3 045	2 229	3 006	3 692

The home consumption should be very much more important than the export. Prices show rather much fluctuation, the price from 1924 to 1928, for example, was 100 from 100 to 1924, 1925 from 100 to 1926, 1927 from 100 to 1928, and 1929 from 100 to 1930, gradually showing a tendency to rise to 100.

Botanical aspect (1, 5). — Tung oil is obtained from the seeds of *Aleurites Fordii* Hemsl. growing in central and western China. Another species, *Aleurites montana* E. H. Wilson, is found in south-eastern and southern China, Northern Indo-China, Siam and Burma and yields an oil which possesses similar properties to those of Tung oil. These two oils, often mixed, are exported under the name of Chinese Wood Oil.

Aleurites Fordii is a quick growing small tree which occurs especially in the Yangtze valley, where it is grown on hill sides in land unsuitable for ordinary cultivation. Summers are hot and humid, winters relatively dry and slight frosts occur and snow may cover the high spots. For Itchang in the centre of this part of the country the following climatological data are available:—

	Rain (mm.)		Temperature
Spring (March-Apr.-May)	301	April	16.5°
Summer (June-July-Aug.)	515	July	28.5°
Autumn (Sept.-Oct.-Nov.)	242	October	18.7°
Winter (Dec.-Jan.-Febr.)	71	January	3.5°

For *A. montana*, a very quick growing tree of larger dimensions which is cultivated in the same way, climatological data from Canton and Hongkong may be used as an average.

	Rain (mm.) Canton	Temperature (C) Hongkong
Spring (March-Apr.-May).	613	21.5°
Summer (June-July-Aug.)	720	27.3°
Autumn (Sept.-Oct.-Nov.)	187	24°
Winter (Dec.-Jan.-Febr.)	143	15.7°

The presumption therefore is, that *A. Fordii* is likely to thrive best in climates which are less tropical than those which favour *A. montana*. In the region between the Yangtsekiang and the southern provinces both species occur, *A. Fordii* dominating to the north and *A. montana* to the south.

Both trees are deciduous and shed their leaves at the commencement of the cold weather.

A. Fordii has a low branching habit of growth. The flowers are produced before the leaves in drooping clusters. Each cluster is made up of one or more female flowers surrounded by male flowers, but usually there is but one female flower to the cluster. In America it is hoped to develop by selection a multiple cluster type, which may be expected to crop more heavily.

A. montana produces flowers after the leaves have been formed, the flower clusters being developed on the young wood.

The fruits also differ in some respects. Those of *A. montana* are pear-shaped, spotted and wrinkled, the fruits of *A. Fordii* being apple-shaped, smooth and not much spotted. The first species contains three seeds in the fruit, the second five.

Its culture in China (1, 5). — Its culture is restricted to land unsuitable for other use, but as the steep hillsides of the Yangtse basin offer many small patches which may carry one or a few trees, the production still is very important.

The seeds are laid out in nurseries and this practice seems to be of much importance for the ultimate results. As is known from experiments in other countries a large number of the seedlings are very weak and of not much value. This nursery practice enables the farmer to eliminate the poorest growers.

Sometimes a small grove is found on less steep ground. Here every tree usually gets 20-25 sq.m. room and yields are obtained of from 9000-11 000 kg. of seeds per ha.

The fruits are harvested when not yet fully ripe. They are put into small heaps and covered with straw and grass. A fermentation process sets in by which the seeds are freed and are easily cleaned.

It is however supposed that this fermentation process is deleterious to the quality of the oil; in America an oil was obtained from ripe fruits without fermentation of higher quality and very much lighter colour.

Experiments in the United States of America (5, 7, 9). — Very soon after the war American consumers of tung oil realised the danger of absolute dependence on one source of supply. A period of high prices in 1923 caused the American Tung Oil Corporation to be formed, which started with a capital of \$100,000 as a co-operative effort among the members of the American Paint and Varnish Manufacturers' Association. This Corporation was not formed with the sole aim of making profit out of the growing of tung oil trees as a business, but primarily to demonstrate what could be done with tung oil trees as a crop in the hope of encouraging farmers to cultivate the tree on a large scale upon a commercial basis. Also it was thought that tung oil plantations on the less profitable sections of average farms in suitable localities might ease the lot of the farmers in the Southern States who had suffered heavy losses with sugar and citrus growing.

A few tung oil trees had already been successfully grown in various parts of the Southern States; the oldest of those trees was some fourteen years old at that time (1923).

The corporation acquired land adjacent to the Agricultural Experiment Station of the University of Florida, about 270 acres. The first seedlings were planted out in the spring of 1924 and since then the work has steadily proceeded with ever increasing confidence and indications of a successful outcome. By 1926, 2500 acres had been planted, 4000 at the end of 1928 and about 5000 at the end of 1929. In addition 500 acres have been planted in States other than Florida. In January 1929 an oil mill was erected at Gainesville (Fl.) with a capacity of 1000 lb. of seeds per hour.

A most important feature in the study of tung oil is the fact that it has always been liable to heavy adulterations. One of the most interesting points of attention about the American production is the prospect of securing a really pure oil. And apart from the question of adulteration, the Chinese methods of manufacturing the oil are so primitive that the oil is often much darker in colour and more variable in its characteristics than it need be.

It has been found that the American produced oil is superior to the imported oil. The Florida Experimental Station gives the following recommendations.

1. The best time to sow is the middle of February (under Florida conditions). About 60 days are required for germination, but great variation is found in germinating energy particularly when the seed is old. Single seeds should be used, and not the whole fruits. The seeds should be planted 3-4 inches deep and from 8-12

inches apart in the nursery rows. These rows should be not less than 3 feet apart, to permit ample cultivation between them.

The nursery site should be moist but at the same time should have good drainage. Waterlogging is fatal to the young plants and unduly dry conditions cause a severe setback.

Cultivation should be shallow.

2. After one year in the nursery the seedlings may be transplanted to the field, using the same methods as are used in transplanting fruit trees. After transplanting they should be cut back leaving a shoot 12-14 inches long.

Experience has shown that the mortality among transplants is 1-3 per cent. After the third year mortality is negligible.

3. It is recommended that trees should be planted 12 $\frac{1}{2}$ by 30 feet; after the seventh year alternate trees should be removed giving a distance of 25 by 30 feet. In hilly country contour planting is to be recommended.

4. In Florida the fruits are allowed to ripen on the trees. When ripe they fall to the ground and are left under the trees until thoroughly dry. On a commercial scale the seeds are separated from the fruits by means of mechanical decorticators. The seed after removal of the husks can be stored in any dry place.

For seeding purposes the seed should not be removed from the fruit until immediately before sowing, and not carried over from one season to another.

In Florida trees of an age of 8 years are nearly 30 feet high with a spread of 28 feet. Some young trees commence to bear fruit in the third year though cropping on a commercial basis is not expected to commence until the fifth year. It is generally held that the trees will reach full bearing in their tenth year. The oldest trees in Florida are not more than 25 years and are vigorous.

Figures from a company at Gainsville for a garden of 30 acres with well cared for trees of 5-6 years of age are: — in 1927 — 9 182 lbs of dry fruits; in 1928 — 16 421 lbs; in 1929 — 39 006 lbs. At the end of six years there were, according to these figures, 1 300 lbs of fruit to the acre, yielding approximately 280 lbs of oil and, at a price of 15 cents per lb an outside return of 42\$ per acre.

A tree aged 20 years produced a crop of 250 lbs of fruits, which is equivalent to approx. 54 lbs of oil, giving 7 \$ per tree or 700 \$ per acre; if all trees should yield as much.

The Florida Experiment Station reports that *A. montana* grows vigorously but comes later into bearing than the *A. Fordii*. Both species, being dormant in winter were not injured by a low temperature of 15°F (= -9.5°C.). Hybrids of both species have been secured by cross pollination, *A. montana* being used as the male parent. Fertiliser experiments were started with *A. Fordii*.

Experiments in Australia (5). — In New South Wales experiments were started by the Botanic Gardens at Sydney. There are some 1000 trees now planted, at intervals since 1919. The first experiments were made in 1913; of these only one tree (*A. Fordii*) remained, which began to bear fruit after three years and yielded 1 $\frac{1}{2}$ bushels in 1918.

The composition of fruits and oil is normal but no data on yields of commercial fields are available.

Prospects for tung oil production in New South Wales are regarded as very satisfactory, the trees developing very well and showing a vigorous healthy growth.

Considerable efforts have been made in New Zealand to establish this new industry on the Northern Island. A syndicate of local agriculturists has been formed to plant 2000 acres under tung oil in the Helensville district. A nursery was started with a nucleus of 1000 plants.

Another report shows that it was proposed to develop 8,000 acres in Auckland province with *A. Fordii*.

The Queensland Forests Ltd. is energetically preparing to develop tung oil plantations in North Queensland. This company reported a vigorous growth, plants being 12 inches high at 3-4 months from the time of sowing.

Experiments in Malacca. (8). — As the temperature in China during the growing season equals that of tropical regions, or is even higher, and the rainy season coincides with the high temperature, it seemed possible that the cultivation of tung oil trees would be possible also in the tropics. Moreover, the related species *A. triloba* Forst. (= *A. moluccana* Willd.) and *A. trisperma* Blanco are very common in the tropical part of Asia.

It was to be expected, however, that *A. Fordii*, coming from the northern part of China would be the least adapted to tropical conditions.

The Department of Agriculture of the Straits Settlements and Federated Malay States started a first experiment in 1914, importing seeds of *Aleurites Fordii* through the Bureau of Plant Introduction of the U. S. A. in January of that year.

These seeds germinated freely and the resultant seedlings were planted at the Government Experimental Plantation at Kuala Lumpur. Although the plants showed considerable promise at the start, after attaining a height of about 5 or 6 feet, their growth was completely arrested and they soon developed a stunted appearance which clearly indicated that this species was unsuited to cultivation under local climatic conditions. In March, 1924, over 10 years from the date of planting, the Agriculturist then in charge reported: "Only few plants of this species now remain and they are in very poor condition, although they have been well cultivated and manured. The trees average 5 feet in height, have very few branches and are practically devoid of leaves." The plants in question never showed any signs of flowering and their cultivation was eventually abandoned.

It is now intended to carry out further trials at the Cameron Highlands (Malacca) at an elevation of about 5 000 feet above sea level, but the possibility of success is regarded as doubtful since there is no definite resting period.

Two experiments were made with *Aleurites montana*. The first was started also at Kuala Lumpur in 1919 and the second at Serdang in 1924, both with seed from Hongkong.

The seeds from the first shipment showed a very good percentage of germination and the plants made vigorous growth at first, but after a time they became somewhat straggly and began to throw out numerous suckers near the ground. Measurements taken in 1923 showed that they ranged in height from 4 feet to 16 feet, while the girth varied from 6 inches to 14 inches at two feet from the ground. A few trees commenced to flower in January 1924 but the majority of flowers did not set; only two isolated fruits were produced. Their cultivation was abandoned in 1926, the experiment having proved a complete failure.

The second consignment consisted of 735 seeds, giving about 45 % of germination in seed boxes. As they developed they were removed to small bamboo baskets and in March, 1925 they were planted at a distance of 20 ft × 20 ft.

After planting growth was fairly rapid. One tree commenced to flower in March 1926.

A number of trees flowered during 1927 and a small quantity of seed was collected during that year. At the end of 1928 the majority of the trees had reached the flowering stage but only a small number were bearing fruit. The following is a record of the weight of cleaned nuts produced during the past three years from

an area of approximately $3\frac{1}{2}$ acres :— 34 lbs in 1928 ; 30 lbs in 1929 and 68 lbs in 1930.

Flowering and fruiting occurs throughout the year but is more pronounced during the dry seasons January-February and July-August.

The records show that the weight and composition of the fruits is approximately the same as those of the seeds arrived from Hongkong. The composition of the oil also is about the same, the iodine value (Wijs) only being somewhat lower for the oil and somewhat higher for the fatty acids. The general behaviour of the individual trees is most erratic and specimens are to be found flowering, fruiting and wintering at the same time, which may possibly be due to the absence of a definite resting period. It has also been observed that so far the number of female flowers produced is proportionately small.

It would appear that this species of *Aleurites* is also unsuited to the conditions prevailing in Malaya.

Experiments in Kenya (3, 5, 7). — As in Malacca experimental plantings of *A. Fordii* and *A. montana* have been established, the first originating from Hankow, the second from Hongkong. The results have been more promising than in Malacca. The seeds of *A. Fordii* were sown in August 1922 at an altitude of 5 500 ft. Germination was poor and took 52 days. In May 1924 the resulting plants were from 3-5 ft. high and in a healthy condition. Other seeds were sown at 8000 ft. altitude ; they germinated in 82 days ; 12 of the seedlings were planted out, but in May 1924 only one remained which was 9 inches high. Towards the end of 1923 more sowings took place at various altitudes from 5000-8000 ft. In 1926 it was reported that those planted at Nairobi in 1923 at 5600 ft. were in some cases 5-7 ft. high, while others were stunted, being only 18 inches high. A few of those planted at 8000 ft. were still alive in 1926.

In February 1928 the trees were fruiting fairly freely. They showed however great differences in development, some being 10 ft. high and others only 18 inches. Experiments made in Kenya, elsewhere than at Nairobi, were not successful.

The *A. montana* seed was sown in 1922 at Nairobi at an altitude of 5500 ft. Germination took place in 56 days but was very poor, only one plant surviving, which reached 18 inch. in height by May 1924. Further sowings took place towards the end of 1923 at various altitudes ranging from 5000-8000 ft. The germination was again poor and only a few plants remained. In September 1926 only one plant was still alive and though healthy in appearance, the growth had been slow, it then being only 3 ft. 6 in. high. This tree flowered for the first time in February 1928. The fruits of the *A. Fordii* were very slow in ripening, having been nearly six months on the trees, all through the hot dry weather and the main part of the rains.

Composition of seeds and oil from Kenya fruits did not differ from the Chinese.

Experiments in other tropical countries under British government. (4, 5). — In 1922 seeds of *A. Fordii* were imported into Tanganyika in the Morogoro district. From these seeds a certain number of fruit bearing trees have been developed, which made it possible to distribute African grown seeds in 1927 among planters in Tanganyika and Kenya.

In 1917 growing experiments were started in India, Ceylon and Burma, which were not successful in Ceylon, but more promising in Northwest India and the northern part of Burma.

No data are published about these experiments.

In 1927 the Research Association of British Paint, Colour and Varnish Manufacturers purchased selected seed of *A. Fordii* of the 1927 American crop and distributed it to privately owned farms and estates, Government agricultural stations

and Forest officers from Kenya to the Cape and in Nigeria. A further distribution was made in 1928.

New experiments were started in the Nilgiri Hills, the Malwa plateau of Central India, in Behar and Orissa, Bengal and Assam.

Seed was also sent to the West Indies. The results in Jamaica were negative.

Tung oil trees in Madagascar (6). — In 1902 DUBORD reported in *l'Agriculture pratique des Pays chauds* that an *Aleurites* growing spontaneously in central Madagascar might be *A. cordata*, which is planted in Japan. An investigation of botanical material by JUMELLE showed it not to be *A. cordata* but *A. Fordii*. According to PERRIER DE LA BATHIE this tree, in which nobody there takes any interest, is tending to disappear. It must have been introduced a long time ago, but the natives do not make much use of it. It bears fruit regularly and abundantly and the habit of the trees is healthy and strong.

Experiments in Java (10). — In 1835 JACOBSON imported an *Aleurites* sp. of China into Java, but it is not known if it was *A. Fordii* or *montana*. The more probable is the former. At Buitenzorg the trees produced mostly male flowers. At an elevation of 3000 ft. trees developed less rapidly, but produced fruits at an age of 5-6 years. These experiments were not continued and no *A. Fordii* or *montana* is now to be found in Java, with the exception of some experiments which have been recently started.

Discussion of results (2). — It will be clear from the foregoing, that success has resulted from the experiments in Florida and in Australia and it seems that conditions are also favorable in central Madagascar. In Kenya results have been more promising than in other tropical countries but it is not possible to speak of a complete success.

From the conditions in the country of origin it may be deduced that the climate should provide a resting period for the trees.

Taking into consideration the climatic conditions of the central Yangtze basin and Southern China it seems that any intermediate climate should be favourable for one or both of the wood oil producing species; where the climate resembles that of Southern China conditions would be most adapted for *A. montana*, and where the data compare favourably with those of the Yangtze basin, *A. Fordii* may have the best chances.

Considering first the temperature conditions, we find (degrees C.):—

	S. China	Yangtze	Florida	Sydney	Tanamarivo	Ft. Smith (Kenya)
3 coldest months.	15.7	3.6	12.9	12.1	13	14
next 3 months	21.5	16.5	19.9	17.3	17.3	16
following 3 months	27.3	28.5	26.4	21.6	19.2	17.1
last 3 months	24	18.7	16.6	17.8	17.4	17

From these data it seems that temperature conditions in Florida and Sydney compare favourably with that part of China lying between the two mentioned. Next comes Central Madagascar, although temperature in the main growing season is about 9 degrees lower than in China. This difference is still larger in Kenya. It is therefore not improbable that the lower temperature of the high mountain plateau of Kenya is the cause of success not being complete.

Rainfall data are the following (total in 3 months in mm.):—

	S. China	Yangtze	Florida	Sydney	Tananarivo	Ft. Smith
3 coldest months.	143	71	100	111	8	38
next 3 months	613	301	101	74	68	72
following 3 months	720	515	146	90	292	74
last 3 months	187	242	105	134	89	215

Florida and Central Madagascar compare most favourably with China ; Sydney and Ft. Smith show important alterations. When, however, temperature is of more importance for a resting period than rainfall, the better results in N. S. Wales may be explained thereby. Distribution of rainfall in Kenya, however, shows many irregularities, caused by the topography of the country. It is therefore not improbable that places may be found, which show a better combination of rainfall and temperature.

When we compare these data from places where the experiments met with more or less success, with those where only failure was met with, we see the following :—

	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
Colombo	26.1 82	26.5 48	27— 121	27.5 290	27.8 307	26.9 212	26.7 113	26.9 97	26.9 127	26.3 365	26.4 319	26.2 161	Temp. Rain.
Singapore.	25.7 215	26.1 155	26.8 166	27.1 174	27.5 182	27.3 169	27.2 172	27 217	26.9 181	26.7 208	26.8 254	25.9 263	Temp. Rain.
Buitenzorg	24.9 449	24.3 408	24.7 422	25.2 412	25.2 374	24.9 277	24.5 265	25— 227	25.3 345	25.3 420	25.1 395	24.6 373	Temp. Rain.

These data show that temperature and rain do not provide conditions for a resting season. We therefore may presume that the wet tropics are not adapted for the growing of *A. Fordii* nor of *A. montana*. The best condition are to be found in the wet subtropics.

If the results of the experiments in New South Wales remain satisfactory they may indicate the suitability also of the Mediterranean climate for the growing of these *Aleurites* species, which would be of enormous importance for the countries of those regions.

As, however, the *Aleurites* species prefer a soil with a slightly acid reaction, and in countries under Mediterranean conditions alkaline soils mostly prevail, much stress should be laid on the choice of the soil.

Chinese wood oil production in the wet tropics (9, 10). — Although climatic conditions are not favourable in the wet tropics for the growing of *A. Fordii* or *A. montana*, there are other *Aleurites* sp. that are native to them. The most common is *A. moluccana* Willd. (= *A. triloba* Forst.), known under the name of candlenut tree (Bankelnussbaum, Bancoulter). The seeds of this tree produce a drying oil (also known as *lumbang* oil) but of greatly inferior quality to the Chinese wood oil. When during the war supplies of linseed oil became scarce in Java, a substitute was found in this oil. As soon as normal supplies became available, however, this new industry vanished.

A far better quality of oil is produced by *A. trisperma* Blanco, native of the Philippine Islands, but also planted in Java. The oil of this tree seems to be used for adulteration of the Chinese wood oil. It is a good drying oil and is much used as a varnish and for caulking of vessels.

These species cannot of course be substituted for *A. Fordii* or *montana* as their products differ much from tung oil.

It seems, however, probable that they could provide a good base for hybridisation. By this process it might be possible to get a hybrid adapted to the wet tropics and producing an oil of the same qualities as the tung oil. As moreover *A. moluccana* and *A. trisperma* grow more strongly than the Chinese species it is not improbable that the production of the hybrids would be larger. It is known that the different species of *Aleurites* cross readily. As it is also known that grafting or budding of *Aleurites* does not offer difficulties, it would be easy to propagate a valuable hybrid by using one of the tropical *Aleurites* sp. as stock.

M. B. SMITS.

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Notes.

ARTIFICIAL POLLINATION OF OIL PALMS. — In the *Malayan Agricultural Journal* of March 1931 a further report is given on the results of an experiment with artificial pollination with the purpose of increasing production. The experiment comprised an area of approximately 8 ha. 137 palms being planted to the ha. in May 1922, which commenced to bear fruit in the latter part of 1925.

Artificial pollination commenced in January 1925 and has been carried out continuously since that date.

The palms receiving artificial pollination were patrolled every alternate day and a maximum of one female inflorescence per palm pollinated every five weeks, *i. e.*, approximately ten pollinations per palm per annum. Fruit bunches were harvested as they became ripe from both sets of palms and monthly records kept of the total number of bunches and their weight. Owing to the large number of bunches handled it was not found practicable to record the actual weights of clean fruit harvested. It may be safely taken, however, that the percentage of fruit to bunch in the pollinated bunches is greater than in the case of unpollinated bunches. The weights of bunches were, in every case, taken in the field to prevent confusion.

The inflorescences receiving artificial pollination were marked and dated on the leaf base in the axil of which the inflorescence arose in order to determine whether the following inflorescence came within the pollination cycle or not.

The following table gives the results for the different years

Year	Pollinated palms						Control palms		Percentage increase in total weight	Percentage increase in weight per bunch
	Pollinated bunches		Unpoll. bunches		Total		Bunches harvested			
	Number	Weight lbs.	Number	Weight lbs.	Number	Weight lbs.	Number	Weight lbs.		
1926	311	4383	506	3596	817	7979	607	3371	136.6 %	153.8 %
1927	1552	27398	1618	9836	3170	37234	2809	18061	106.1 "	174.5 "
1928	1862	50462	1729	13408	3591	63870	3214	28912	120.9 "	201.1 "
1929	1983	60301	2204	31344	4187	91645	3345	49806	84. "	104.2 "
1930	2287	78882	2466	33805	4753	112777	3386	53578	110.5 "	118. "
Total . . .	7995	221426	8523	92079	16518	313505	13301	153729	103.9 %	140.7 %

INDUCED MUTATIONS IN TOBACCO WITH X-RAYS. — In an extensive report of the *Proefstation voor Vorstenlandsche Tabak; Mededeeling 63*. (Java) on principles and results of recent tobacco breeding by that Experiment Station some interesting results are published on the influence of x-rays on mutation.

Inflorescences of a pure strain were used, being x-rayed at a distance of 35 cm. with a tension of 50 kilowatts and about 3 milliamperes for five and ten minutes respectively. All withered blooms and all fruits were previously removed.

In three successive times seed was harvested. In the later seed only mutations were found, and as furthermore from every mutation only one heterozygous specimen appeared (excepting one homozygous) it is probable that the mutation took place in the sex cells.

Only one mutation was visible after the 5 minutes x-raying in about 2500 plants; after the 10 minutes x-raying considerably more.

Of the twenty forms examined eighteen showed a simple segregation, whereby the original strain was segregated beside the new form. Thus these monofactorial mutations originated as hybrids. Only one mutation originated as a homozygote and a bifactorial mutation originated as a hybrid, probably by the union of two monofactorial mutated sex cells.

Genetic analyses of different induced mutations are described in detail.

Parallel mutations to the spontaneous mutation *aurea*-type were numerous. In one and the same generation frequently arose not similar but analogous *aureas*, which indicates that the monofactorial mutation can be a mutation of a chromomer complex.

Here we have a typical case of a strain by external conditions suddenly arriving at a period of mutation for several generations. No direct cause in the external conditions can account for this mutation in groups. We now also understand how strains can originate beside each other, one being immutable, whereas the other for instance is very labile with regard to the *aurea*-factor.

Thus a close analogy exists between natural mutations and induced mutations.

LIBERIA COFFEE AND FERMENTATION. — In Surinam it is almost all Liberia coffee that is produced which is the best adapted to the conditions of that country. Owing to its peculiar taste and smell it was only possible to find a restricted market, the colour of the beans also not being as is wanted. FERNANDES of the Experiment Station at Paramaribo found that these undesirable characteristics of this coffee did not develop when

after removing the pulp of the fruit the bean was not exposed to fermentation but dried as quickly as possible at a high temperature at which the enzymes in the bean are made inactive. It was these enzymes that caused the less desirable quality of the Liberia coffee and it was found that fermentation of the beans after passing the pulper had no influence on its quality.

A machine has been constructed by STORK Brothers, Ltd. at Hengels (Holland) by which the beans are totally freed from pulp without fermentation and partially dried by centrifuge. The beans then enter a rotating drying machine in which they are dried at 80°C. In this way it is possible to prepare market coffee in continuous process in 5 hours from the berry state.

The colour of the beans, which has no influence on the quality of the coffee, depends on the temperature at which it is dried. It is therefore possible by changing this temperature to produce beans of different desired colours.

IMPROVING THE QUALITY OF COPRA. — As supplies of edible oil of all kinds available are increasing rapidly a position may ultimately be reached when the market will become seriously discriminating and competitive, so that bad copra will not be saleable at a profit. The question of the preparation of copra has been a subject of investigation by the Department of Agriculture in Malacca which submits the following recommendations in the April number, 1931, of the *Malayan Agricultural Journal*.

- (1) As far as possible, nuts should, as in Ceylon, be allowed to fall naturally.
- (2) If the nuts are picked, only fully ripe brown nuts should be harvested. Nuts slightly germinating give the highest oil and copra yield.
- (3) Where fallen nuts only are collected and the labour of picking is saved, collecting tours can be more frequent.
- (4) Drying should not be hastened unduly, or unduly curtailed; burning should be avoided and uniform drying assured by free air movement through the copra and by uniform nut collection.
- (5) Drying should proceed until the copra contains 6% of moisture.
- (6) Clean, freshly prepared copra should be placed in clean close woven bags immediately after drying, which should be closed to prevent the ingress of insects.
- (7) The bags of copra should be stored in clean, dry, rainproof stores which allow free air movement around each bag.
- (8) The possibilities of baling should be explored further, chiefly because baled copra is considerably less bulky than copra in sacks (1).
- (9) Producers, particularly native producers, should consider co-operative marketing so that a better grade of copra may be marketed.

M. B. S.

THE DATE PALM IN SPAIN. — The date palm is met with along the south-east coast of Spain up to an altitude of 500 metres. For the most part it is regarded as an ornamental plant. Only the provinces of Alicante, Murcia and Valencia produce dates, the former possessing the greatest number of palms. In general the palms grow on alkaline soil and the irrigation water is equally alkaline.

The distance apart of the palms in plantations is calculated so that the spaces are from 20 to 25 m. in each direction, which allows of good aeration and insolation. If the soil is fertile leguminous crops or fruit trees (pomegranates) are grown under the palms. Frequent watering is practised and superficial tillage.

The fruit is gathered as it ripens.

Fallen leaves are used for various purposes. The dates are sold for food on the markets. For some years large plantations have been established for stock feeding, as all animals readily eat dates at any stage of maturity. According to the observations of M. MUÑOZ PALAO a palm plantation has a stock-feeding value equal to well-managed sown pasture of the same area.

The production of a plantation is valued at 1400 pesetas per ha; cultivation costs never exceed 400 pesetas. (F. M. MUÑOZ PALAO, *Revue de Botanique Appliquée et d'Agriculture Tropicale*, Paris 1931, n° 113).

J. L.

(1) Cf. this *Bulletin*, 1930, No. 12, pag. 453.

CASSAVA CULTIVATION IN JAVA. — The following three methods are in use.

(1) In western Java it is grown in a primitive manner in rotation with rice and groundnuts. Production per ha = 5 or 6 tons of fresh tubers.

(2) In eastern and central Java bitter cassava is grown by natives for sale to Chinese tapioca factories. The varieties grown are numerous. Production may reach 8 or 9 tons of fresh tubers per ha.

(3) In the region of Kediri and Malang there are large European plantations scientifically organised and giving remarkable results. (*Les Produits Coloniaux et le Matériel Colonial*, Marseilles, 1931, no. 73).

J. I.

ANIMAL HUSBANDRY

Problems of Beef Cattle Fattening in the United States.

In a previous article (1) on beef cattle raising it was seen that the highly developed specialisation in cattle farming leads to a separation into the two stages of breeding and fattening in the United States. The distinction though not absolute is very clearly marked. In the Range area there are many cattle breeders who feed their stock well enough for them to be sold directly to the beef market and many feeders even in the centre of the feeding belt who breed their own stock, but nevertheless it may be said that the greater part of the beef cattle are bred in the Range area and then sent some months before slaughter age to the feeding ranches. Sometimes an intermediate stage is interpolated on a «steer ranch», a ranch with good grazing where the cattle reach a certain degree of finish before being sent to the feeder proper.

The differentiation into breeding and feeding ranches carries with it a geographical distinction. The Range breeding area is far from the the great centres of population, while the typical feeding region, the Corn Belt, is situated between the Range country and the great consuming centres in the east.

In the western Range country it is not possible to produce the feed required to fatten such quantities of cattle. On the other hand the transport costs of bringing fodder from the agricultural districts of the east and central west into the distant Range country and of its return in the form of live cattle and beef would be excessive. Hence it is preferred to transport the feeder cattle to the districts where they can be fed up for market. Cattle are also bred in the irrigated farming regions of California and elsewhere where factory by-products, especially of the cotton industry, are obtainable at low cost. The principal feeding region is however, as said above, the Corn Belt of the east centre of the country. The map reproduced in fig. 1 shows the movements of stock from the cattle raising to the beef consuming centres.

About one-third of the beef cattle of the Range district is fattened in the Corn belt.

The profit of the feeder comes less from increasing the quantity of the beef than from improving its quality. It has in fact been found that for feeding to be profitable the unit of live weight of the finished animal must fetch a higher price than that of the animal when purchased. Feeding reduces the percentage of slaughter-house waste and improves the quality of the various cuts.

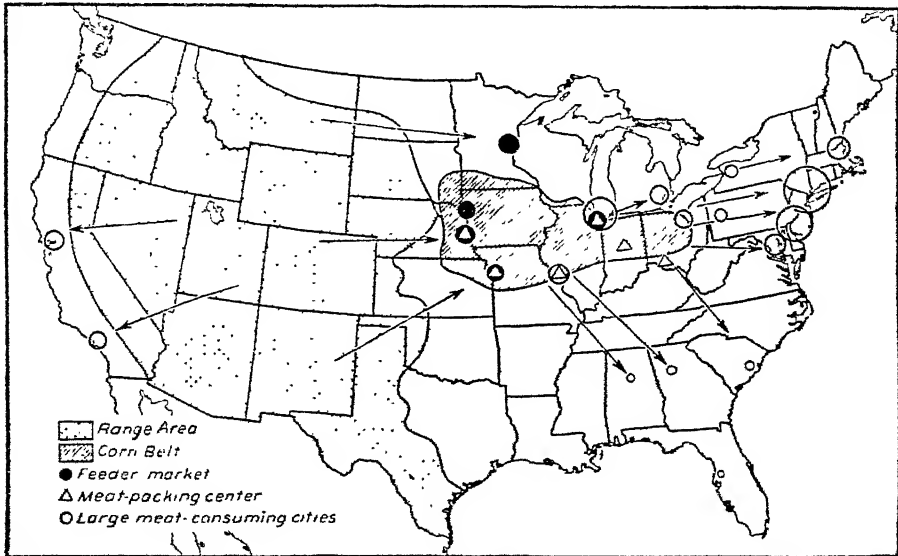
Specialisation frees feeders from the problems and trouble of breeding and

(1) See this *Bulletin*, 1931, No. 5, pp. 180-192.

enables them to devote themselves entirely to their own restricted business problems. Feeding, unlike breeding, is entirely a business : speculation with a capital in comparatively rapid circulation. The feeder is not concerned with long period problems such as grassland management and herd selection. He buys and sells his stock when conditions are favourable and exercises thus a stabilising influence on the meat market. Feeding is for this reason better able than breeding to adapt itself to changing market conditions and requirements, and new ideas find a more ready application in practice.

The important question of the returns from the feeder industry has raised a number of problems now under active study. In few branches of agriculture in

FIG. 1. — *Movement of beef from the Range.*



the United States has as much research been carried out as in this. The problems may be divided into two classes : — those concerned with the choice of cattle for fattening and those concerned with feeds. The former will be dealt with here, the other being reserved for a later article.

The aim of the feeder. — The feeder seeks to increase the weight and quality of his cattle in the shortest possible time and with the expenditure of a minimum of capital and work ; his profit is the difference between the purchase and sale prices less the cost of fattening. One of his chief problems is what kind of stock will give the greatest profit.

Type of feeder cattle. — With regard to the type of cattle the interests of the Range breeders are opposed to those of the Corn Belt feeders. Fine boned, low set, highly refined animals, representing the ideal type for the feeder, are little sought by the breeder as not corresponding to his requirements. In the Range area, as explained in the previous article, the animals are exposed to difficult conditions exacting great resistance to weather and activity, because of the distances they must cover in feeding ; they must be hardy and very prolific. These requirements

are little in accordance with what the feeder demands of his animals because they necessitate a heavy-boned type, comparatively long-legged and bulls of a pronouncedly masculine type. Thus it is not always easy for the feeder to find the type of beef animals he wants, particularly as he is not always willing to pay the much higher price that would correspond to the greater risks and higher costs of the breeder. This will always remain a difficult problem. The only solution will be by endeavouring to obtain by selection a beef-producing propensity in the robust stock which is suited to the Range area. To-day there are two distinct types, the "Range type" and the "Corn Belt type", representing the two opposing interests. The former type includes the large, strong, coarse-boned, upstanding cattle, the latter the small, low-set, fine boned animals.

At the Experimental Station of the University of Wyoming research has been carried out on the fattening propensity of different feeder cattle. It was found that the low built cattle of the Corn Belt type fattened more quickly and at lower cost than cattle of the Range type or of an intermediate type. The differences, however, were not of a high order.

In the Range country improvement of the type of beef cattle is closely related with improvement of the pasturage, management and feeding. The desirable type to-day is without doubt that of the Corn Belt, but as unfortunately the good fattening ability of the latter is associated with lack of hardiness, it is essential that breeding of the improved cattle on the open range country shall correspond with improvement in the general conditions there. As a matter of fact wherever conditions are more favourable the short-legged easily fattened type is already found. For the breeders who have to contend with very difficult conditions the comparatively small difference between the prices obtained for the two types of cattle does not make it worth their while to run the risks entailed in breeding the Corn Belt type.

The animals are still judged by purely empirical and subjective methods. Measurements are exceptional.

Breed and grade of feeder cattle. — The question of breed is closely related to that of type, as is also the question whether the animals should be purebred or of more or less mixed breeds. The feeder cattle trade makes no distinction between different breeds, and it is regrettable that the literature of the breeds contains little information about their varying response to fattening and on the farm evasive replies are obtained to questions. The trade does however distinguish three grades:—choice, good and common feeders. The first grade includes mainly highly selected stock, but judges only by appearance. The third grade includes "scrub" cattle, i. e., crossbreeds not yet improved by the blood of beef breeds properly so-called. As regards facility of fattening the first grade proves always the best. The animals put on weight more rapidly on less food, give a higher dressing percentage, form lean and fat in the parts preferred and all the products are of a better quality and obtain a higher price.

The choice animals are however not always the most paying to the feeder. His profit depends largely on the purchase price of the animal, so that if the difference in price between the choice and the common animal is exceptionally great the latter gives most profit. The suitable kind of animal depends also on the quality of the available feed. Choice animals give good returns only on good quality feed, so that where the feed is poor it is more profitable to keep less refined stock. It has been proved by experiments with the 3 grades that the choice and good quality animals give always the greatest increase in live weight, but in certain cases the greatest profits have been received from the poorer animals.

Sex of feeder cattle. — The greater part of the feeder cattle are steers, for most

of the cows are retained in the herd for breeding and the old cows and bulls are slaughtered without fattening. About half the heifers however are not utilised for breeding and so are either sent to the feeder or killed at once. The female calves not being as highly valued as steers for fattening their rational utilisation is a very important question. Numbers of experiments have been carried out to determine to what extent their lower market value is justified.

It is incontestable that from the feeder's point of view cows have certain defects. He frequently buys without knowing whether or not they have been bred and thus runs the risk of feeding a pregnant cow and so having no real increase in weight. Also cows in heat excite the feeder herd and thus affect adversely not only their own gain but also that of the other heifers.

At the Agricultural Experiment Station of the University of Minnesota comparative feeding tests were carried out with 3 lots of calves; the first consisted of 10 steers, the second of 5 steers and 5 heifers and the third of 10 heifers. All three lots were fed similarly. The results of the experiment clearly showed that the steers fattened more quickly and cheaply than the heifers and that it made no difference to fattening whether or not the steers were separated from the heifers.

The Stations of Colorado and Arizona have obtained similar results. In two cases however the heifers reached the state of finish more quickly than the steers. Moreover at the Experiment Station of the University of Illinois similar experiments have shown that the superiority of steers over non bred heifers is not as great as is supposed. Fat female calves not weighing more than 700 lbs at the end of 140 days of fattening present considerable advantages, which makes it unjust that prices should be lower on account of their sex. If heavy animals fattened for a long period (200 days) are desired however, steers are found slightly superior to heifers, but the superiority is not sufficient to justify a difference in price of 1 to 3 cents per pound of carcass. There are no essential differences between the dressing percentages of steer and heifer. After 200 days of fattening heifers gave a higher dressing percentage than steers. As regards the quality of the meat the fat heifers were not inferior to the steers; the female calves fattened for 140 days were found even better than the steers.

All these experiments combine to show that heifers may give a better result to the feeder if the period of fattening is short (not exceeding 140 days), while steers are preferable for long feeding (200 days). It should however be noted that these experiments related to "baby beef", i. e., calves submitted to fattening very early (mean weight — 375 lbs).

To avoid the disturbances caused by in-heat heifers spaying is sometimes resorted to, but spayed heifers are not many in comparison with the open heifers owing to the difficulty and cost of the operation and the failure of the market to pay a sufficient premium for such heifers. Spaying however gives the feeder security against pregnancy, which warrants a higher price.

The chief argument against fattening female stock lies in the fact that the butcher gives a distinctly lower price for them. The average price for the twenty years 1907 to 1927 per 100 lbs of beef cow or heifer was 3.85 dollars, whereas for steer it was 5.80 dollars. This lower price is based on a supposedly lower quality of the meat and hide, on the risk for the butcher of the cow being pregnant and on the less favourable distribution of the meat. These assertions attempting to justify the existing difference in price are in part well founded but that they are not adequate to justify the existing difference is shown not only by the Illinois experiments but also by those described by Mr. HULTZ in his book on *Rangeland*

Production. The price difference springs in reality from a prejudice against heifer beef.

Summarising it may thus be said that fattening of female stock presents no drawbacks if it is started early and less protracted than for steers. Further investigations should dissipate the still existing prejudice and ensure that fat heifers shall not sell below their true value.

Age and weight of feeder cattle. — It has already been stated in the previous article that the "baby beef" question is one of the problems of beef production most discussed in the United States, owing to the opposing interests of the Range breeder and the feeder of the farming belt.

Developments of recent years have shown an increasing tendency to produce very young finished beef. Hardly 20 years ago beef cattle were for the most part killed at 3 to 4 years, whereas to-day animals of 1 to 2 years are in the largest proportion with the exception of the old dairy cows.

This tendency, which is encouraged by the ever increasing demand for small cuts, leads to the fattening of calves not yet weaned. The production of "ultra baby beef" gives finished animals in 8 to 10 months.

But the question as to how far the production of ever younger beef is profitable to the breeder, the feeder and the butcher is still under discussion and the subject of much controversy among experts. It is not a matter concerning only the United States but of general importance in world beef production. Therefore it would seem of value to summarise the numerous experiments and experiences and opinions published or communicated to the writer by various experts in the United States.

Feed consumption of animals of different ages. — The experiments concerning absolute consumption of feed by animals of different ages and weights are not readily comparable because the consumption varies in different kinds of animal and according to their condition when fattening is begun.

If the daily feed consumption per head is considered it will always be higher for animals above 3 years old, whereas if that per unit of live weight is considered it will be greater in the young than in the older animals.

If, on the other hand, the whole fattening period is considered it appears that in young animals the feed consumption per head is lower but per unit of live weight is higher, because the time of fattening is generally longer than with older stock.

TABLE I. — *Feed consumption of cattle of various weights.*

	Daily ration in pounds		Average total consumption of corn per animal bushels
	Grain	Legume hay	
Heavy cattle	22.4	9.8	48
Middle-weight cattle	19.2	8.9	49
Yearlings	17.6	8.0	47
Calves	18.3	6.2	44

Absolute gain in live weight. — This also depends largely on the condition of the animals when put on feed, consequently the results obtained are not always in agreement. The daily gain in live weight is at the beginning greater in older animals, but it diminishes rapidly as the fattening period progresses. In young stock, on the contrary, the gain is small at first but steadily increases.

Calves and yearling steers are growing as well as gaining flesh and fat during the fattening period, whereas the older animals are no longer growing. Over the whole fattening period the daily gain is greater with older than with young stock, as has been shown by the above-mentioned enquiry carried out in the Corn Belt on a large head of cattle. Some contradictory results will not alter this rule. In the investigations of the Iowa Agricultural Experiment Station the daily gain of calves increased until the 18th day of fattening and then slowly declined. From experiments in Arizona it appears that the daily gain changes during the course of fattening, increasing for calves and diminishing for yearlings and 2-year-olds.

TABLE II. — *Average daily gains per head in cattle of different ages.*

	1st period 4 weeks	2nd period 6 weeks	3rd period 4 weeks	14 weeks Total
	Pounds	Pounds	Pounds	Pounds
Calves.	1.92	2.01	2.22	2.04
Yearling steers	3.31	2.27	1.48	2.36
2-year-old steers	3.11	2.89	2.11	2.70

But Table II alters its aspect if the gain in live weight during the whole fattening period is considered for, as has been stated, the period is longer for the younger stock.

The average weight increase of a large number of feeder cattle in the Corn Belt from the beginning of fattening until slaughter were:—calves 329 lbs, yearlings 298 lbs, medium weight steers 285 lbs, heavy steers 262 lbs. If the live weight when put on feed is considered the gain in the young animals is even more striking:—in general the calves doubled their initial weight, the yearlings increased it by 60 %, the 2-year-olds by 35 to 40 %.

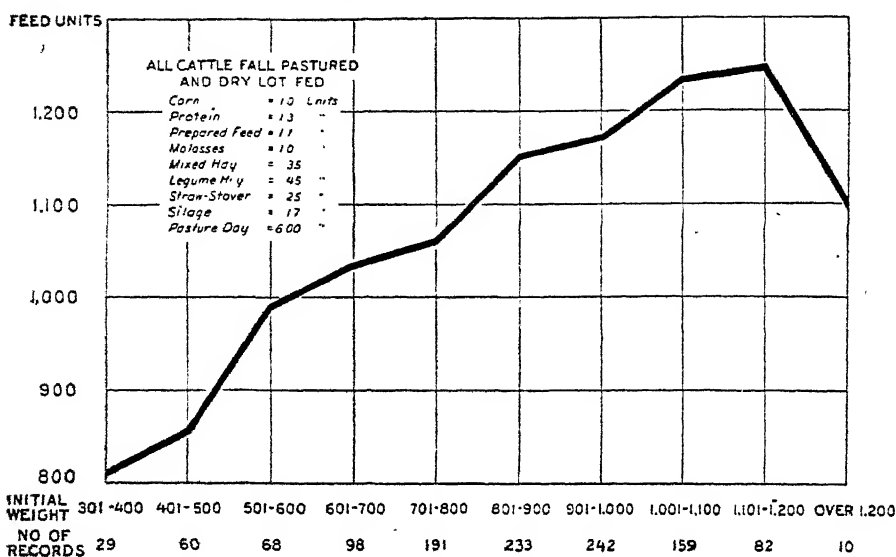
Relation between weight increase and feed consumption.—From an economic point of view for the feeder the absolute feed consumption and the absolute weight increase in animals of different ages are of less importance than the resulting relationship between the feed consumption and the gain in live weight.

Numerous experiments have established with comparative certainty that for a given quantity of feed a non-fattened animal increases per unit of live weight proportionately more than a fattened animal. In Arizona, for example, it was found that to increase the live weight by one unit the feed requirements over and above that of calves were 26 % for yearling steers, 64 % for 2-year-old steers and 105 % for full grown cows. To increase the live weight by 100 lbs it was found that calves required 530 lbs of feed (expressed in dry matter), yearling steers 668 lbs, 2-year-old steers 772 lbs and cows 1087 lbs.

In another experiment carried out at the same Station the requirements to increase the live weight by 100 lbs were: for yearling steers 845.75 lbs of feed, for 2-years-olds 964.62 lbs, for fully grown steers 1,151.85 lbs. The Corn Belt enquiry gave very similar results. To produce the same live weight calves required 64 % of the feed required by the heavy steers, yearling steers 75 % and medium weight steers 87 %.

Figure 2 shows diagrammatically that more feed units are required to produce 100 lbs of gain with increasing weight of the animals.

In the lot over 1200 lbs in weight there were only 10 animals, which may account for the irregularity of the gain in this lot. In this connexion the results obtained

FIG. 2. — *Feed units per 100 pounds gain on corn-fed cattle of different weights.*

from fattening experiments at the Iowa Station are of interest. Two-year-old steers, yearling steers, and calves were fed for 120, 210 and 300 days; the quantities of feed consumed by the different lots to produce 100 lbs gain of live weight are shown in Table III.

TABLE III. — *Feed required per 100 pounds of gain.*

	Time on farm	Maize — Pounds	Linseed meal — Pounds	Lucern hay — Pounds
2-year-old steers	120 days	652	63	267
Yearling steers	120 days	488	65	252
Yearling steers	210 days	576	76	304
Calves	120 days	368	70	166
Calves	300 days	504	89	232

Table III shows clearly that during an equal period young animals profit better from the feed than older ones. If fattening is continued to finish, that is for yearlings to 210 days, for calves to 300 days, the feed consumption per unit of live weight is still in favour of the young animals, but the difference is less; thus it is seen that for the young animals a shorter fattening gives more economic results.

The result of all this experimental work is to show that young stock profit better from fattening, which is mainly because they chew better and have more perfect digestion.

Live weight increase and nature of feed. — The above rule is not invariably applicable for it may be modified by the kind of feed. Young animals naturally have smaller digestive organs and so are not able to utilise bulky feeds as well as larger animals, though they can digest concentrated feeds better. If therefore the feeder has available more roughage than concentrate older stock will in his case give a

more profitable weight increase. This fact accounts for the results of the Kansas Station where better results were obtained by feeding fresh millet or millet ensilage to yearling steers than to calves.

Length of fattening period and age of animals. — It has already been stated that young animals require more time than older ones to reach the stage of finished beef. From the figures of SNAPP it appears that 2-year-old steers take 5 to 6 months, yearlings 6 to 7 months and calves 8 to 9 months, in normal conditions and with Corn Belt methods. The Corn Belt enquiry gave the average time of fattening as 4 months for heavy animals, 6 months for medium animals, about 7 months for yearlings and a little over 7 months for calves.

Other investigators, notably the Experiment Stations of Arizona, Montana and Nebraska, are in agreement on this point. In Arizona on the same ration 3-year-old steers reached a state of finished beef in 105 days, while 2-year-olds took 120 days. The fact that the fattening period is longer for young animals is to the disadvantage of the feeder, for it increases his work and retards the circulation of his capital.

Age of feeder cattle and pig breeding as a by-product of cattle fattening. — In the Corn Belt pig production is carried on in association with cattle fattening, profiting from the fact that pigs utilise their feed better than cattle. They are allowed to feed on the food the cattle waste and what undigested food remains in their excreta.

According to DECHAMBRE feeder cattle yield as human food in the form of meat only 3.5 % of the feed they consume, whereas the pig yields 19 %.

The importance of pigs depends on the age of the cattle ; it is less with young stock which, as has been stated, chew their feed better and digest better, so that their excrement contains less utilisable matter. It has been proved that the development of pigs behind cattle is less as the cattle are younger. The gain in live weight of the pig produced indirectly by 1 bushel of maize fed to an old steer does not compensate for the much smaller gain in the live weight of the steer in comparison with a younger animal. This is clearly demonstrated in Table IV.

TABLE IV. — *Quantity of beef and pork produced per bushel of maize fed to cattle.*

	Pounds of beef	Pounds of pork behind cattle
Heavy cattle	5.45	1.71
Medium-weight cattle	5.81	1.82
Yearlings	6.34	1.60
Calves	7.47	1.44

The figures are averages obtained from a large number of animals. Certain experiments carried out in Iowa and Nebraska have given similar results.

Market value of young and old fat cattle. — It has already been stated that for fattening to be profitable the feeder must sell at a higher rate per unit of live weight than that at which he purchased. His interest then is not so much in the gain of live weight as in the increase in value of the unit of live weight produced by fattening.

Per unit of live weight young feeder cattle are slightly more dear than older animals but the difference is not great. Formerly older animals obtained a higher price for slaughter than young stock, but of recent years the prices per unit according to age and weight have approximated more and more closely. To-day it is the calves or yearlings that fetch the highest prices, rarely the older stock.

In view of the lower cost of production per unit of live weight of the young animal the difference between the purchase price of the animal and the market price of the finished animal necessary to cover the cost of feeding may be less with younger than with older animals. The production of young fat animals will thus in general be more profitable for the feeder so long as this difference in value between young and old exists. This conclusion is arrived at as a result of the experiments with different aged animals at the Experiment Stations of Iowa, Nebraska and Colorado and also from the Corn Belt enquiry.

But it is not in every case however that young stock will be best for fattening. The profit of the feeder depends, as has been shown, on a number of factors including the kind of feed, length of fattening, management, costs, varying interest on capital, etc. This explains why in other experiments (Montana and Arizona) yearling and 2-year-old steers gave more economical results than calves. There is, moreover, a minimum age for economical fattening and this question of the production of "baby beef" with very young animals will be further examined.

Dressing percentage and beef quality of animals of different ages. — One of the principal reasons given in America to account for the production of increasingly young beef is the growing demand for smaller cuts which goes with the increase in the number of small families. Many people however consider that with modern slaughterhouse methods the butcher is able to give to the cuts more or less the size and shape desired.

This together with the experimental results of the Iowa Station leaves room for doubts on the advantages of killing very young animals. The quantity of meat seems to depend less on age than on the degree of fattening. In Iowa and Arizona, where similar experiments were carried out, the dressing percentage of animals of different ages varied between narrow limits.

The beef from yearlings and 2-year-olds has considerable advantages over that from calves; it is darker in colour, the fat is better distributed, the meat keeps better and has more flavour. The waste in cooking is however higher in beef from older animals. But further research is necessary to settle the question definitely.

Development of baby beef production. — The animals discussed above have been the Range cattle shipped at different ages to the feeder in the fattening region proper. The desire of the feeder to profit from the better fattening of the young has led to the fattening of calves even before weaning. These calves are of course bred by the feeder himself. They are fed from their 3rd or 4th week a grain ration varying in quantity according to the size and rate of fattening desired. In this way finished calves can be obtained at the age of 9-10 months and they find an easy market.

The future will show how far the combination of breeding and baby beef production in the intensively cultivated regions of the Central West offers prospects of further development and whether its present development is not only a result of the very low prices of feeds. It is doubtful whether in normal conditions the keeping of a herd on valuable land can compete with the extensive breeding of the Range country, even if the production of very young animals offers genuine advantages.

Length of fattening period. — This is closely connected with the sex, type and age of the animal and the kind of feed. The most advantageous fattening period cannot thus be said to be definitely fixed. It is preferable therefore to establish for each particular case at what stage of finish the feeder can draw the greatest profit, that is to say, at what moment to sell.

In general it may be said that (1) the older the animals the shorter must be the

fattening period, (2) for female animals the feeding must be short and (3) intensive feeding can shorten the period.

Conclusions. — Fattening is, as has been said, a speculation. In consequence of the rapid circulation of capital it is more readily and rapidly adaptable to market conditions than is breeding. Hence it may be said that it occupies a higher economic level and its conditions approximate more closely to the present ideal than can be the case with breeding. There are however still certain problems of the feeder awaiting solution, and these are summarised below.

(1) The determination of the optimum fattening type is made difficult by the opposing interests between breeder and feeder, which necessitate a compromise. A cattle breeder with extensive grazing of poor quality could profitably collaborate with a feeder having at his disposal much roughage and less concentrates and *vice versa*.

(2) The utilisation of cows and heifers for fattening is a question which is nearing solution as a result of advantage being taken of their more rapid fattening in comparison with steers; the optimum length of fattening period must be separately determined for cows and steers. The still considerable difference in price of beef cows and steers does not appear fully justified and should become less as the prejudice against female beef is recognised as unfounded.

(4) The best age for fattening may be regarded as settled. It is now established that where good quality feed is available young animals fatten more economically. In favour of the fattening of young stock it may be said that small cuts are most in demand and they waste less in cooking. Against this it may be said that (a) the fattening period is longer, which retards the circulation of capital and increases work, (b) there is less pork profit from following hogs, and (c) the finished beef is of slightly inferior quality. The balance however comes out in favour of the younger animals.

But the optimum age for feeder stock depends also on local conditions, economics and seasonal conditions.

(5) The optimum length of fattening depends on sex, type, age, feeds and the market. It must therefore be studied for each individual case.

(6) The breeding of feeder cattle in the farming region of the East and Central West caused by the desire for ever younger animals will scarcely be able to compete with the Range breeding of the West and will not in any case develop much.

In summing up it may be said that as regards cattle the development of technique tends more to a rationalisation of fattening and a qualitative improvement in the products than to an increase in quantity.

The production of young beef animals contributes to a reduced beef production in the United States. This tendency will develop further for it is possible that the future will see a still greater number of yearling steers and calves for slaughter.

The problems of fattening feeds will be discussed in more detail in a later article.

S. TAUSSIG.

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AGRICULTURAL INDUSTRIES

Notes.

Industries of Plant Products.

MAXIMUM UTILISATION OF THE WHEAT GRAIN. A new and inexpensive machine invented by E. MANFRONI (Italian patents nos. 155491, 162213, 204541) husks grain without removing the nutritive substances adhering to the husk (gluten, albumen, cerealin, lecithin, nitrogen, fats, enzymes). An excellent flour is obtained (Profs. ABBA and ISSOGLIO, Institute of Hygiene, Turin), containing all the useful substances with a 15 % economy in wheat.

The saving in baking is 12 %, 100 kg. of flour at 90 % giving 125 kg. of bread.

The bread is white and has a good flavour. The flour is also suitable for making food pastes, etc.

Soft wheats treated with the Manfroni machine before milling retain their gluten and other substances as well or even better than hard wheats. Army biscuits, food pastes, gluten bread, etc., made previously from hard wheat flour are remarkably successful with soft wheat flour treated in this way. Hard wheats also, with their cortical and ligneous parts removed thus, acquire a much higher baking and food value.

FLINTINESS OF BARLEY AND ITS RELATIONSHIP WITH THE CONTENT IN ALBUMINOID SUBSTANCES. According to ERICH flinty barley is richer in albuminoids than mealy grain. Experiments with 7 different barleys by the BISHOP method, to determine the content in salt soluble albumen (decomposition products, albumen and globulin), alcohol soluble hordein and insoluble glutelin, showed that the hordein content has most influence on flintiness in barley. (*Zeitschrift für das gesamte Brauwesen* 54, 1931).

NEUTRALISING CASTOR OIL. The chief drawback to the use of castor oil as a lubricant has been its acidity. According to the *Revue pétrolière* (1931, no. 411) the free fatty acids may be successfully neutralised with triethylamin without any modification of the valuable lubricating properties of the oil.

STORAGE OF GRAPES. Experiments at the experimental cold store of the "R. Stazione Agraria" at Turin with a great variety of table grapes have shown that long storage presents a number of difficulties if it is desired to preserve intact the freshness and the characteristics of each variety.

Refrigeration at 1-2°C allows of such preservation for about a month without the grapes showing signs of withering or mould.

Immersion in water, keeping in cellophane bags or between layers of powdered cork (Spanish system) do not give satisfactory results with Italian grapes.

The varieties Darkia nera, Lagrima di Maria, Marsiglium, Ohanez, Pergolese and Razaki rosso, which are more compact and less juicy, may be stored longer.

The *detachment index* of the grape from the stalk is no indication of the state of preservation during storage. Certain grapes (Chasselas doré, Rose de Nègrepont, Bergamo) showed a decrease in acidity and an increase in reducing sugars; others showed only an apparent increase in sugar content. (*Rivista del Freddo*, Pesaro 1931, N. 2).

ACCELERATED FERMENTATION OF SACCHARINE JUICES (GRAPE JUICE, ETC). When a small quantity of yeast extract or must of beer is added to yeasts starting anaerobic fermentation in a phosphated glucose solution the rate of fermentation is found to be doubled almost instantaneously and to be maintained at this high rate. The substance capable of catalytically accelerating alcoholic fermentation is called the Z factor and has been studied by SWARTZ VON EULEN and his students. It is a thermostable body, dialysable and differing from co-zymase (adenylpyrophosphate of Mg). From the experiments of MEYERHOF and KEN IWASKI (1930) it appears that only in aerobic conditions (shaking up yeast in a phosphatic solution in the presence of oxygen) does yeast possess the property of synthesising and setting free the Z factor.

Grape juice concentrated *in vacuo* without heat and even very dilute extracts of wine yeasts show a marked Z effect. It seems that there is an equilibrium between the yeast and the Z factor: low Z effect in anaerobic fermentation and destruction of the factor during anaerobic development of yeast. (*Comptes rendus des Séances de la Société de Biologie*, 1931, No. 21).

PHYTOSTEAROLS OF SEEDS, FLOURS AND FRUITS. MONCEAU and BIGÉ are studying the distribution of the phytostearols in the pericarp and pulp of fruits and in the seed coats, albumen and cotyledons of seeds. Hemp seed (4.5 %), chickpeas (0.7 %), soya beans (0.68 %), oats, millet and barley are the richest in these substances. (*Comptes rendus des Séances de la Société de Biologie*, 1931, No. 19).

PECTIN FROM LIMES (*Citrus Limetta* Risso). The sweet lime contains an essence rich in acetate of linalyl and 8.5 % of sweet juice.

A. ROMEO has studied exhaustively the composition and behaviour of the pectin of the lime and has shown that it is possible to obtain economically from the fresh rind about 3 % of excellent pectin with a gelatinising power of about 150 times its weight. (*Annali di Chimica Applicata*, 1931, Vol. 21).

DISTILLATION OF LEMON ESSENCE. The tower still, used for the first time by Dr. BONELLI in Sicily for the distillation of ethereal oils from plants, presents considerable advantages (fuel economy, continuous work, etc.) over the ordinary 'ball' still. (*Annali di Chimica Applicata*, 1931, Vol. 21).

Industries of Animal Products.

INFLUENCE OF LIGHT ON THE OXIDATION OF FATS. — A long series of experiments on fats carried out by H. COLIN LEA shows the influence of light on their oxidation. The following are his results:—

(1) In the presence of light oxidation has at the beginning little effect on the free acid of fats.

(2) Oxidation is appreciably accelerated by artificial light; a direct exposure of 5 minutes to the sun is sufficient to produce the beginning of rancidity; the reaction is autocatalytic and a short exposure to light accelerates subsequent oxidation.

(3) The intensity and duration of illumination greatly increase oxidation, which varies according to the temperature.

(4) The varying susceptibility to oxidation of the different samples of beef fat examined shows that this characteristic is due rather to the chemical nature of the fat than to the presence of foreign matter (non fat).

(5) The bleaching of the yellow pigment of beef fat begins in the first stage of oxidation.

(6) The relationship between the intensity of the Kreis Test and the quantity of active oxygen of the fat varies with the temperature.

Numerous graphs and numerical data are given. (*Proceedings of the Royal Society*, London 1931, Vol. 108, No. B. 756).

G. S.

BOOK REVIEWS *

General Agronomy.

VON OPPEN J., *Mussolini und die Landwirtschaft*, 64 p., 35 Abb. 1 Karte, Verlag von J. Neumann, Neudamm u. Berlin 1931.

[An account of a three weeks' tour made by the writer (President of the Chamber of Agriculture for the province of Brandenburg and Berlin) through the agricultural regions of Bologna and Central and South-East Italy. The tour enabled him to gain information about Italian agriculture in general and about the results obtained and expected from the law of Mussolini on land development.

The technical impressions received are presented in the form of a diary kept daily during the tour. This method of treatment gives the publication a particularly vivid interest].

Tropical and Sub-tropical Agriculture.

VAGELER P., *Grundriss der tropischen und subtropischen Bodenkunde*, 210 p. mit 10 einfarbigen Bildtafeln und 2 farbigen Bodenprofilen, Literaturübersicht und Sachregister, Verlagsgesellschaft für Ackerbau m. b. H. Berlin S. W. 11, Schönbergstrasse, 5, 1930.

[This work, with an introduction by Prof. O. LEMMERMAN, is the result of 20 years of experience in Africa and Asia, more especially in Tanganyika and the Dutch East Indies.

Every chapter shows evidence of this experience and the book is therefore a valuable guide for all who have to deal with tropical and subtropical soils.

The first chapter discusses the problems of these soils; the second deals at length with the minerals that are important in soil formation, with rocks and secondary soil formations.

The third chapter discusses the formation of organic substances and the types of vegetation which they originate, and the fourth the relation between climate, topography, vegetation and soils.

The genesis of different soil types in the tropics and subtropics is discussed at length in the fifth chapter; the next three give advice on how to choose a plantation site, the physical properties of the soil in their relation to different crop plants, and the chemical side of the same question.

Throughout the whole work the author lays stress on the peculiar character of tropical soils, which is caused by the constant high temperature and which makes it necessary that their valuation should not be based on ideas that may apply to the non tropical parts of the world, but need to be corrected for tropical conditions.

The experience gained by the author from his work as soil scientist in the service of the Java Tea Experiment Station, as well as the influence of MOHR's ideas on tropical soil problems, are traceable throughout this valuable volume by anyone acquainted with agricultural research work in the Netherlands Indies].

M. B. S.

KEMPSKI, *Die Ramiekultur*, 116 p., Literatur 16 p., 50 Abb. Tropenverlag Fr. W. Thaden, Hamburg, 1931. Preis: 2 RM.

[Wherever a particularly durable and damp resistant fibre is desirable ramie (*Boehmeria nivea* and *B. utilis*) offers such advantages that its market is assured. There is,

* Under this heading short synopses are given of books sent for review.

moreover, no fear of its competing with cotton growing as it requires different soil and climatic conditions. The yield in fibre is 10 times greater than that of cotton, thus ramie is of great interest in the present economic difficulties.

The present work contains a study of ramie from botanical and economic stand-points and statistical data on its production and uses in different countries, also interesting and detailed information on the physical and chemical qualities of the fibre, which as regards length and strength are superior to cotton and linen. A full account of the technique of cultivation is given, with special stress on sexual and asexual propagation. A chapter is devoted to decorticating machinery, a satisfactory and economical retting system being essential for the output and development of ramie cultivation.

The work forms part of the manual '*Neues Handbuch der tropischen Agrikultur*', by G. ARNOLD, H. V. COSTENOBLE, C. EITLING, etc., which is appearing in separate numbers].

N. v. G.

Animal Production.

FAVILLI Narciso, *Nozioni comparate di anatomia e fisiologia degli animali rurali*. Nuova Enciclopedia agraria italiana, Parte VI, Torino 1931.

[The introduction contains fundamental histological and cytological facts; Part I deals with the locomotor and nervous systems, the sense organs and vital phenomena of farm animals. Part II is devoted to the comparative anatomy and physiology of the organs of digestion, respiration, circulation, excretion and reproduction.

The work contains clear explanations of the matter treated and will be of use to farmers].

E. M.

FORESTRY

The Future of Subsidiary Fuels of Vegetable Origin (concluded) *

In the production of small charcoal on any large scale, it is advantageous to utilise the smaller branches, etc., of the trees, thus making the ordinary charcoal more homogeneous.

Hitherto in charcoal burning in the open it has been necessary to mix large and small wood, this course having an influence on the charcoal yield in consequence of the varying reactions within the material for conversion during the burning process. Previous selection and the use of all kind of small wood for "charbonette" production would remove this difficulty. At the same time the larger charcoal would be of more uniform size and better quality and this lighter form made from younger wood might after proper sifting supply excellent gas charcoal which could very suitably be mixed with small charcoal made solely from branch wood. These advantages, which are undeniable with the ordinary old fashioned forms of charcoal making, are even more conspicuous with more modern methods.

Methods of charcoal burning in the open, using portable metal kilns, have been for a long time the object of special studies and experiment in a number of countries. In this field also however the difficulty of a previous determination of the precise objects in view such, for example, as the recovery of by-products or the production of particular kinds of charcoal have made it difficult to arrive at any satisfactory solution. The portable kilns have generally proved too heavy for easy working, the recovery of the most valuable by-products necessitating the use

* For the first part of this article see *Monthly Bulletin of Agricultural Science and Practice*, No. 7, pp. 281-289.

of cumbrous apparatus. Frequently too the by-products lacked homogeneity and it was a difficult matter to transport them to market.

Except in particularly favourable topographical conditions and where the material was specially valuable from the point of view of by-products, as in the case of the wood of certain specific kinds of trees, these kilns for use in the open with all their technical complications have increasingly lost favour, particularly where local and transport conditions present difficulties.

Thus it has come about that the problem of finding a really satisfactory method of charcoal making in the actual forest environment remains still unsolved.

In the present preeminently practical age, it is fully understood that the value of any general charcoal producing process largely depends upon the easy manipulation of the plant employed. Hence the main object now in view is the gradual overcoming of the various difficulties which any proposed change in methods is bound to encounter. Simplicity in working, mobility and rapidity in the carbonisation process are the chief characteristics looked for in a charcoal kiln.

The thermal index of carbonisation is speaking generally the safest criterion for the manufacturer. But in addition to maximum yield, in judging the value of a plant, other practical considerations have to be taken into account such as are in many cases suggested by the special exigencies of charcoal burning in the forest environment. It may be admitted that in certain conditions and where there is a wide range of material to work on, plant which facilitates the recovery of certain by-products, tar for example, may prove very valuable, but where the chief object is the easy and continuous conversion into charcoal of fellings made entirely for this purpose, it is believed that the simplest form of kiln will be the more appreciated.

In France, Belgium, Italy, Spain and also in Austria, European countries which are making every effort to improve their vegetable charcoal production in the light of the importance of such improvement in assisting to regularise forest production in general, portable kilns are being recommended. At the same time manufacturers are making every effort to take account of practical local requirements in forest charcoal burning.

Kilns of varying sizes made in sections and with or without a floor plate in metal are now being tested for working as single units or grouped in sets with reserve elements. With certain kinds of such plant it is possible to recover the by-products, but the majority of manufacturers are chiefly concerned to turn out a simple type of apparatus giving rapid carbonisation.

At the same time modern distillation processes for forest products are increasingly coming into use even where the installation is on a relatively modest scale. A distillation plant always forms part of the equipment of the larger forest enterprises in America, Russia and certain Colonies.

The simpler forms of kilns which leave by-products out of account produce 8 to 11 % more charcoal than the ordinary methods. This higher yield should be considered as in itself a recommendation but as a rule it is not sufficiently appreciated and it is by no means easy to popularise the adoption of metal plant. Here in the psychological element is an important factor, for it is well known that in places far removed from the great industrial centres any change of method is distrusted owing to the deep seated respect of the inhabitants for use and custom.

Timber merchants and dealers, especially when working on a large scale, have as a rule shown little interest in charcoal production which they regard as a matter of secondary importance. As a rule they are satisfied with local practice and are not concerned to intervene or regulate in any way the technical side of the charcoal production cycle. Hence they have been content to leave charcoal production and

its organisation in the hands of gangs of charcoal burners, paid at fixed rates, and it is generally believed that charcoal burning in the open can be carried out by specialised workers only. The result is that as regards the use of kilns, which represents an improvement in methods in an important branch of forestry production, owners are as a rule ill prepared to produce charcoal in accordance with sound industrial principles.

It has however to be recognised that, if at first the kiln method proves unsatisfactory, this is mainly due to the absence of workmen who are accustomed to the handling of this kind of plant.

Production is seen to vary greatly according to methods of loading, speed of putting up and dismantling and the nature of the fire control.

It is believed that these difficulties can be obviated by the inclusion, among the forms of encouragement offered to stimulate the adoption of the kiln process, of the assistance of skilled mechanics, capable of instructing the local workers during the initial trial period. In this way it should be possible to provide practical evidence to convince those who are in doubt that the kiln process requires its own special operators whose services will be fully utilised under the changed system.

Apart from these considerations the chief impediment to the development of the use of these plants is their high initial cost.

MERENDI (Italy) states that at least 6 to 8 kilns are necessary for any form of trial on an industrial scale. The purchase of the installation thus involves an expenditure which cannot easily be borne by a charcoal producing enterprise of moderate size.

He is also of opinion that, having regard to the extreme simplicity of the plant required, it should not be difficult for the manufacturers to lower their prices and thus probably to secure a larger sale. Recent competitions for carbonisation equipment have clearly shown the difficulties which have still to be met. It has also been observed that, in order to make a proper judgement of yield capacity, competitors must work under equal conditions as regards the quality and moisture content of the wood to be used in the tests.

ERCULISSE (Belgium) has taken special pains to obtain a proper method of comparison for maximum yields. In order to determine the maximum yield of a charcoal burning plant, he takes into account the amount of heat required for the complete conversion of 1 kg. of wood (q_1) and also the amount of heat produced by the combustion of 1 kg. of wood (q_2). The maximum yield of a plant (x) may

be determined by the use of the equation $x q_1 = (1 - x) q_2$, where $x = \frac{q_2}{q_1 + q_2}$.

In this calculation the heat lost by evaporation is left out of account.

For the determination of q_1 ERCULISSE adopts the data for higher calorific capacity of organic matter given in the *Chemiker Kalender* of 1930. These data have been supplemented by the determination of the water content and calorific capacity of samples of wood utilised in the recent competition for charcoal burning kilns held at Tervueren in Belgium.

This writer has also established the relation between these data for higher calorific capacity, with the corresponding value for lower capacity and, taking as his basis a general average of 4,200 calories, he has drawn up a scale of lower calorific capacities ranging from 0 to 1000 as shown in relation to its humidity content by the wood used for the competition. In determining q_1 he took as his guide the reaction scale of KLASON (*Encyclopädie der technischer Chemie*) with its three phases of carbonisation, ranging between 100 and 170°C (first phase), between 170-270°C

(second phase) and between 270 and 400°C (third phase) and has thus arrived at the conclusions given below.

By the complete carbonisation of wood at 400° C, 1 kg. would supply:

Wood-charcoal.	0.412 gm.	Gas	0.149 gm.
Water and other liquid products	0.344 "	Volatile oils	0.095 "

These figures, if applied to a ton of wood, would correspond to 88 m³ of gas.

In determining the calories, the writer formulates the following hypotheses: the liberation of volatile substances requires as many calories as the conversion into steam of an equal quantity of water at 100°C; gases and vapours leave the kiln at 270°C.

The following comparative table has been drawn up by the writer, *E* representing the moisture content and *x* the maximum yield:

<i>E</i>	<i>x</i>	Amount of wood in thousandths	<i>E</i>	<i>x</i>	Amount of wood in thousandths
0.	0.758	0.310	0.500	0.645	0.266
0.100	0.754	0.310	0.600	0.583	0.240
0.200	0.737	0.303	0.700	0.483	0.200
0.300	0.715	0.295	0.800	0.284	0.117
0.400	0.686	0.283	—	—	—

In discussing the yield equation he arrives at the conclusion that the phenomenon of wood carbonisation should be shown as a diminishing function.

The writer is particularly concerned that the determination of the maximum yield of a charcoal burning kiln should be made with great care. While waiting for the tracing of the curve of the phenomenon as shown by the results of the competitions, it is necessary that, for the various trials, wood of uniform quality, of which the calorific capacity and moisture content has been previously ascertained, should be supplied.

G. DUPONT of France has observed that oak, pine, poplar, elm and oak show practically identical characteristics during the process of distillation, all being in a state of active decomposition between 300 and 350° C., while below 250° water is practically the only result. The results obtained by DUPONT's experiments regarding the final calorific yield, *i. e.*, the number of effective calories in the charcoal produced by burning 1 kg. of wood is maintained up to about 275° but falls sensibly beyond that point.

As regards on the one hand the question of a better means of utilising the service of workers employed in charcoal burning and on the other the problem of the simplification of the carbonising process, the results so far obtained are not sufficiently numerous to justify the drawing of any practical conclusions for application in general practical work.

According to estimates made by BUSSETTI in Italy, in the conversion to charcoal, a typical mass of 7 tons of wood, 3 ordinary day's labour and 10 day's fire consumption can be saved by the kiln as compared with the older method.

Hitherto the working periods of the labour employed have been irregular and uneconomic and as the wages paid to labour represent the greater part of the production costs, this aspect of the question calls for careful study and analysis.

By the use of portable kilns it is possible as a result of the rapidity with which they effect carbonisation to keep in constant touch with the gangs of woodcutters who in their turn can bring together at one place large quantities of the wood intended for charcoal production seeing that in due course the kiln plant will arrive on the spot and by working in "battery" formation, rapidly convert the collected material.

BUSSETI makes the following comparison to show the difference between the efficiency of the older methods and of the portable kiln system:—

Details	Older methods	Portable kiln system
Amount of wood	20 stères = 7 tons	20 stères = 7 tons
Time of loading	9 days	6 days
Burning period	20 days	10 days
Cooling period	2 days	1.5 days
Amount of charcoal obtained	1.3 tons	1.4 tons

By using branches and high forest waste for small charcoal production the writer believes that from 1/4 to 1/5 of the results of a complete ordinary felling could be converted into charcoal. The soft wood of the undergrowth could also be utilised to great advantage for the same purpose.

He is also of opinion that by converting branches and small wood into charcoal in special kilns such as are already being tested with the object of finding a suitable practical type, it should be possible to effect an economy of from 30 to 35 % as compared with the results obtained by the present methods of producing small charcoal.

The yield given by these special kilns should be very high, for the charcoal would leave the kiln perfectly carbonised and thus with that homogeneity which is so important for gas production. There would be the further advantage that water would not be necessary for cooling off the material.

These views are regarded with favour by persons who have direct acquaintance with the present conditions of charcoal production. Further experimental work on this special type of kiln would be very valuable from the point of view of the standardisation of forest products, the need for which is fully recognised in a number of countries as facilitating the finding of a constant and remunerative market.

The production of a special grade of charcoal for gas production might be very helpful in this connection. In many countries which are importers of petrol steps are being taken to popularise gas producers for transport and hence special efforts are being made to standardise the production of charcoal.

It might be dangerous to consider the production of vegetable charcoal for gas making as likely to enter into any serious competition with the production of ordinary charcoal. The good technical qualities of wood charcoal for gas making as adapted to purposes of transport would not be so highly appreciated, especially in the earlier days of its adoption, were it not that it can be purchased very cheaply. In certain cases of the adoption of gas producers for industrial transport, it has been found that the cost of gas production was too high. Hence every effort must be made to employ scientific production methods so as to be able to put on the market a high grade fuel at a reasonable price.

In France the attention of the public is being constantly directed to charcoal fuel and increasing interest is shown in improved methods of charcoal production. At Godarache there is a permanent Station dealing with charcoal making and car-

bonisation processes and a constant propaganda is carried out in favour of the adoption of the kiln system. The production of small charcoal in France is reckoned as now amounting to 1,200,000 tons annually and MATIGNON is of opinion that by improving the methods of manufacturing small charcoal by utilising kilns, both a higher yield and a superior quality could be obtained. He considers that by using all kinds of wood and small stuff which are suitable for the production of small charcoal it should be possible to have a supply of 1,500,000 tons of small charcoal yearly. As regards energy this amount is equivalent when converted into gas to 1,000,000 tons of petrol.

A law has recently been passed in Italy with the intention of obtaining by 1936 a standardisation of charcoal production in the forests through the adoption of the kiln system.

In certain Italian Crown Forests experiments in charcoal production are proceeding along side of transport tests with camions run on "forest gas". Experimental work has also been carried out with promising results and is still in progress in certain privately owned forests.

DE CAPITANI, the Italian expert, is of opinion that, for the supply of compounds on a vegetable charcoal basis, made with the products resulting from the carbonisation of the residues of forest fellings, the timber trade and agricultural industries generally, even if one-fifth only of the total national resources of this order were utilised, could obtain a total annual production of 500,000 tons of solid fuels suitable for gas producers. He also states that in quite recent years charcoal compounds obtained by the carbonisation of olive dregs are being produced on a commercial scale at Bisceglie and Vico Pisano. These are the first instances of European activity in this field and it is worth noting that the methods employed allow for the recovery of the by-products.

In Belgium, where the wood distilling industry and related carbonisation have long been in vogue, attempts are now being made to increase the amount of wood used for charcoal production, and some highly important experimental work is being carried on. Experiments are also being made in Spain, where increased attention is now devoted to new systems of carbonisation with the object of obtaining supplies of subsidiary fuels.

Similarly in Switzerland the advantages of the more scientific processes of carbonisation are very fully appreciated, especially from the point of view of supplementing forest exploitation work which is already highly organised. It is considered that the use of charcoal as a carburant may become a highly important factor in local transport.

In Austria, a country in which there is constant progress in regard to forestry, the increased use of modern systems for charcoal production within the forests themselves is regarded as an effective means for increasing production while at the same time an important element in forest protection.

In Germany also where hitherto there have been considerable doubts as to the value of charcoal as a carburant, opinions are now undergoing a change.

Even in Russia, where there is no question of anxiety as regards the consumption of the petrol found in the country, increasing attention is being given to scientific methods of charcoal production.

In fact it may be concluded that propaganda and the general encouragement given to the use of wood charcoal for motor transport are already bearing fruit and there are signs, which are of hopeful augury for the future, of a both general and specific confidence in the value of vegetable carbonisation as a solid form. Moreover the interests of forest production in general, which are becoming increasingly

recognised, should be well served by the opening up of the new possibilities suggested by the wider adoption of these fuels.

Up to the present in the efforts made to give wood charcoal a place of honour among subsidiary fuels of vegetable origin, its cheapness, which can only be enhanced by the standardisation of production methods, has been a great recommendation. According to an estimate which is generally accepted and substantiated by a number of scientific tests, 1000-1050 gm. of wood charcoal supply in power of traction the equivalent of a litre of petrol and this result could be still further improved, if wood carbonised at about 250°C were in general use for gas production.

As a matter of fact the absolute "record" for cheapness among solid vegetable carburants belongs to wood, 2-2.1 kg. of which have the same value as a litre of petrol.

DUPONT, the French authority, states that the yield in gas of partly carbonised wood would be increased by its impregnation previous to carbonisation with phosphoric and other catalysing acids, which encourage the decomposition of carbohydrates at an earlier stage than that of lignin.

In Rhodesia the use of wood rendered soft by distillation has made it possible to take advantage of woods hitherto considered to be of no commercial value. These woods when used directly for fuel proved unable to maintain water at boiling point.

In French West Africa heavy motor lorries have been satisfactorily driven on gas produced by the distillation of woods of little importance such as 'sibiri', (*Crossopterix Kotschyana* Fenzl.). The analysis of the wood of certain acacias in Italian Somaliland, hitherto regarded as useless, has shown that they are extremely suitable for gas production.

Industrial wood working establishments have recently begun in many places to install gas production plant. In Italy under the auspices of the Italian Touring Club and the National Association for Smoke Abatement, a special society known as the "*Consorzio Industrie Residui Combustibili*" has been formed, which has no financial interests to serve but devotes itself to the encouragement of the increased utilisation of industrial waste products by protecting and giving technical assistance to the factories with which it is associated.

Wood or wood charcoal fuels seem to be specially indicated in the case of motor traction on the farm and the extensive trials now being made daily in this connection show that vegetable charcoal is coming to be regarded as a very useful element.

In Belgium "forest gas" is now coming into use for working tree felling machinery. There is here an instance of a very important practical application which, if it can be further extended to the transport of forest products, might by itself alone account for a very considerable consumption of charcoal.

Much may also be expected from application to heavy military motor transport in which the possibilities of consumption would be very large but this question is still at the experimental stage.

The use of gas producers for transport is now receiving considerable encouragement in a number of States taking the form of premiums or reductions in customs duties or other charges. Thus in Portugal reduced charges amount to 50 % for vehicles fitted with gas producers and there are no import duties on kilns for charcoal production coming from abroad.

In Norway and Sweden the use of gas producers for transport is beginning to make headway and in these countries the movement is assisted by the exemption of foreign gas producer plant from import duties.

In Turkey and Yugoslavia gas producers have been introduced and are used for motor traction ; in Uruguay vehicles run with gas producers are exempt from all fiscal charges while in France there is a reduction of 50 % on permits, etc.

In addition, the French Ministry of War has instituted a temporary system of premiums, which will be awarded for the purchase of gas producing plant or its adaptation to transport purposes. The scale of premiums adopted is as follows : Lorries fitted with gas producers, load 75 quintals, 13,500 fcs. ; load 50 quintals, 10,000 fcs. ; load 25 quintals, 7,500 fcs. ; load 15 quintals, 5,000 fcs. — Heavy farm tractors fitted with gas producers, 7,500 fcs. ; light tractors, 6,000 fcs.

A premium of 2,500 fcs. is allotted to owners of lorries already in service, who desire to equip them with a gas generating plant.

In Italy a continuous press campaign, which for a number of years has emphasised the necessity for encouraging in every way the adoption of charcoal as a carburant, will, it is hoped, achieve the desired results and the movement is supported by the Smoke Abatement Committee and a special commission.

In addition the question of subsidiary fuels occupies a large space in the technical and ordinary Press of a number of countries. Congresses, Exhibitions, Competitions, etc. are also held in such countries as are interested in the question of reducing the importation of petrol.

The following is a list of the principal Congresses, Exhibitions, Competitions, etc. of interest in connection with this movement, which have been held from 1928 to 1930 : International Congress on Peat, Lyons, 1928 — Congress on Charcoal Production, Grande Epinette (Belgium), 1928 — National Competition for Gas Generators, Rome, 1928 — Congress on Vegetable Charcoal, Lyons, 1929 — International Competition for Vehicles driven by Gas Generators, Milan, 1929 — International Charcoal Production Competition, Monza (Italy), 1929 — Forestry Week, Barcelona, 1930 — First International Congress of the use of Charcoal as a Carburant, Brussels, 1930 — Exhibition and International Competition for Charcoal Production Processes and Gas Generators, Terveuren (Brussels) 1930 — Forestry Week, Charleville (France), 1930 — Franco-Belgian Road Race Paris to Ostend, 1930 — Military Lorries Speed Tests, in Algeria, 1930 — Mechanical Ploughing Competition 1930 — Establishment of " The Charcoal Centre " at the Maison Alfort near Paris, 1930.

The International Congress at Brussels arrived at the conclusion that it is necessary to fix standard types of carburants by utilising the charcoal available under different forms in the various countries. In dealing with the large scale research work required for attaining this object, the Congress resolved that an International Bureau should be set up for carrying out the experiments. This resolution was proposed by the Italian delegation and has been communicated to all the countries that took part in the Congress. Naturally the most economical material available in the different countries will be the most popular with consumers provided that the type is fixed and that there is a sound sales organisation.

As regards liquid fuels of vegetable origin the distillation of forest products should enable a good supply of good class carburants to be well maintained. Forest products are also particularly well adapted for supplying solid fuels and the outlook in this connection is highly promising. Wood and wood charcoal constitute a simple type of fuel, having specific qualities and inexhaustible reserves. Moreover these products are not the result of a new industry, which has in the first place to contend for its place in the world. Certain improvements in production methods and a careful and studied organisation of the supply should suffice to maintain them securely in their present advantageous position.

It is therefore much to be hoped that the various States will, wherever the need is felt, devote special attention to this question and increase their efforts to encourage the speedy development of the regular production of wood and wood charcoal for use in gas production.

Any special expense involved should not be considered as either excessive or risky, for the question is closely concerned with protection of the forests, which are of inestimable value and importance in every country.

Any means of forest protection is in the public interest and while conferring considerable benefit to the generation which carries it out will also greatly redound to its credit in the estimation of the generations to come.

S. CABIANCA.

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MONTHLY BULLETIN

OF

AGRICULTURAL SCIENCE AND PRACTICE

GENERAL AGRONOMY AND CROPS OF TEMPERATE REGIONS

Report on the experiments of the first four years of the Cerignola arid-agricultural station (*concluded*). *

Observations on the quantitative variation in the weed flora have shown that besides seasonal fluctuations the nature of the crop affects the amount of weeds, some tending to be more heavily weed infested than others, and the influence is carried over to the following crop.

After tillage with soil mellowing machines and by the JEAN method a heavier weed infestation is observed. Bare fallow tends to produce more weeds than grassland and the tendency is transmitted to the next crop.

Plots tilled every year to 25 or 30 cm. in depth are less weedy than plots which have been ploughed to this depth only at the beginning of the rotation.

Infestation gradually diminishes during the course of a crop rotation. When a meadow crop takes part in the rotation the following crop tends to be less weedy.

On uncultivated land the maximum growth of weeds was found in the second year, followed by a rapid decrease.

Observations on the nature of the weed flora have shown that in a plot which has rested for one year the good leguminous plants and fodder grasses predominate, while other species occur only in small numbers. With continued years of rest there is an increase in the number of species and families represented with a preponderance of species not belonging to the natural uncultivated pasture, to which it seems that the good fodder plants yield the place.

Crop production has been studied in relation to rotation, tillage, rainfall and fertilising.

As regards crop rotation, in Series *L* wheat after fallow and horse beans gave a higher yield than after vetch meadow and oats. Oats gave a higher yield after 'Mentana' wheat than after 'Bianchetta', whose notably more vigorous growth reduced more the productivity of the soil.

In Series *R* beans were generally more successful after wheat than after oats. Wheat gave the best results after fallow, then after horse beans and least well after meadow; the non-cultivated plot gave an increasingly higher yield the longer it had rested.

Oats after oats gave a consistently lower yield than after meadow. Vetch meadow and oats gave better results after oats than after wheat.

* See part I in the *Monthly Bulletin of Agricultural Science and Practice*, No. 8, August 1931, pp. 293-297

The production of all crops, and particularly of wheat, is directly dependent not only on the annual rainfall but chiefly on that which falls in the last decade of March and in April.

As regards tillage with different implements there is always a marked gain from the system of mixed tillage: mellowing implements for use before summer and the plough for autumn use. The results of pre-summer tillage are not conclusive.

Amongst the three ploughing depths tested the best was 25 cm., equally at the beginning of the rotation and later.

There are no marked differences between the yields produced after autumn tillage with the plough, the disc plough, the rotary tiller, the cultivator or the sub-soiler, though the plough seems to tend to give a slightly higher yield.

The fertiliser trials, though only of secondary importance in the Cerignola experiments, showed that a mulch of 1 quintal to the hectare of ammonium nitrate had more effect with 'Bianchetta' than with 'Mentana' wheat.

The comparative trials of phosphatic fertilisers (superphosphate, 'Mineraria' slag, 'Mineraria' mineral phosphate, Thomas slag) showed the superiority of the effect of 'Mineraria' phosphates on the crops, though they disappear more rapidly from the soil.

The application of potassium sulphate at a rate of a quintal to the hectare on beans gave no appreciable results.

Sulphate of ammonia at a quintal to the hectare increased the production of beans. It was as useful applied at seeding time with 'Cappelli' and 'Bianchetta' wheat. Applying a quintal of calcium cyanamide per hectare with the seed was as effective with wheat as the ammonium sulphate. A mulch of ammonium nitrate at the same rate also had a favourable effect on wheat.

Ammonium sulphate had a beneficial effect also on oats, as had ammonium nitrate and superphosphate as a mulch.

After fallow wheat shows a higher straw-grain ratio than after meadow, which is explained by the higher content in soil moisture after fallow.

For good results with lucerne repeated surface tillage (hoeing followed by harrowing) is more necessary than preparatory tillage to a great depth, though ploughing to 30 cm. is required.

Sowing in rows 18 cm. apart appeared the most advantageous. The quantity of seed to use varied between 42 and 59 kg. to the hectare.

Mulches were less effective with lucerne.

Lucerne scientifically cultivated gave higher yields than the common annual meadows of the region, for it is less sensitive to unseasonable weather.

The number of crops given by lucerne depends on temperature and rainfall.

Straw applied as fertiliser at rates of from 4-8-12 quintals per ha. had a deleterious effect on the growth and production of wheat, and the reduction in yield is in direct proportion to the amount of straw dug in. As fertiliser straw contributes also to increasing the straw-grain ratio. On vetch meadow and oats however contradictory results have so far been obtained.

In a pot experiment at Portici with straw, stubble and tailings at rates of 50-100-150 quintals to the ha., it was found that the tailings alone had a fertilising effect when applied at 50 quintals per ha., while tailings at higher rates and straw and rooted stubble considerably reduced growth; this would seem to be due to the bad soil conditions produced by heavy dressings rather than to the effects of denitrification or the utilisation of the nitrates by microorganisms.

The various systems of tillage and the different fertilisers had differing effects

on the gluten content of the wheats grown. The highest quantity of gluten per ha., were obtained with the mixed system of tillage, using mellowing implements in summer and sod-turning implements in winter or *vice-versa*. Ploughing to depths greater than 20-25 cm. reduced the gluten content of wheat, unless it had been done the year preceding, when it increased the gluten content. Tillage before summer of plots fertilised with ammonium nitrate gave a higher gluten content than was obtained from fertilised but untilled plots. Non-fertilised plots gave uncertain results. Fertiliser did not always give a gain in gluten. The rotation vetch meadow and oats-wheat with phosphates applied to the meadow gave a higher gluten percentage and total than the rotations fallow — wheat and rest — wheat without fertiliser, and even than beans — wheat when the beans received olive residues and basic slag.

* * *

If general conclusions must be drawn, even if certain of them must necessarily be purely provisional, it may be said that the most important factors of weather (rain and temperature, but particularly the former) have affected :— soil consistency, by determining the times for tillage — micro-organic activity in the soil — the vegetative growth and yield of crops — and have contributed towards regulating during the summer the ratio between the residual soil moisture of the preceding crop and the moisture existing at the beginning of the following rainy season.

The order of crop rotations has a great influence at Cerignola. All soil-improving crops, meadow and fallow have had a beneficial effect on wheat yields and, from a technical standpoint, fallow which has received PK fertiliser has been better than root crops and meadow.

The few varietal trials at Cerignola with wheat have shown the varying degrees of resistance of the varieties. 'Mentana' and 'Cappelli' selected wheats have given good results, and 'Bianchetta' as a local wheat.

In addition to the occasional light dressings of organic manure moderate applications of PKN have invariably given good results.

As regards tillage, from this first period of experiments it may be deduced that if the work is well done the implement used is a minor matter. The granular tilth that is readily obtained with mellowing implements is as easily lost by settling, whereas that obtained with the plough and subsequent surface tilling is more lasting. A perfect tilth is obtained with the DEL PELO PARDI plough.

With regard to depth of tillage it may be said that beyond 25 cm. it has not always proved beneficial and that it is better to plough each year to the same depth rather than to plough deeper for the first crops of the rotation.

The 'dry-farming' experiments have not clearly shown either the usefulness of summer tillage nor of deep ploughing in autumn, as has been demonstrated in America.

It should be tested whether it would not be a good plan to revert to the Latin 'novale' system described by COLUMELLA and later perfected by modern science.

* * *

It will be of interest to give a summary of the experiments carried out at the farm of Torre Lama di Montecorvino Rovella (Salerno) under the Portici Institute and in the experimental fields of Portici itself.

As a result of the meteorological studies in the plain of Battipaglia (5 year mean: temperature 16.71°C, rainfall 112 mm.) it can be said that —

(1) wheat in the plain is exposed to excessive rainfall during the seeding and tillering periods;

(2) varieties and strains should be preferred which show a high degree of resistance to excessive rain during the early stages of growth, to rusts and to scald; which give a satisfactory tillering even with high temperatures; which have a medium resistance to lodging and to smut; and which can if possible be sown in January;

(3) yields increase with a lowering of the mean temperatures in January and February and with increased rainfall in April.

A study of soil moisture conditions at the surface and at depths of 6-10-25 cm. has given the following results —

(1) relative atmospheric moisture has after rainfall the most influence on the conservation of soil moisture from the surface to 25 cm. in depth;

(2) the temperature of the air and soil has an indirect influence through the variation it causes in atmospheric humidity;

(3) the structure of the soil, its situation, treatment and vegetation are of fundamental importance in connexion with the moisture resulting from rainfall;

(4) in the rather deep and heavy soils of the Torre Lama Farm after a prolonged summer drought the percentage soil moisture at a depth of 25 cm. is maintained constantly above 12 %.

These experiments require repetition and extension.

The wheat varietal trials at the Institute's Farm at Montecorvino Rovella have shown that in 5 consecutive years the varieties which have given higher yields than the local variety most commonly grown, 'Saragolla Zingaresca', are:— Duro Conti 30, Cantore, Varrone and Luigia Strampelli.

In 4 consecutive years and on a 5-year average the following varieties have given superior wheat:— Virgilio, Duro Conti 41, Ibrido 741 stock 192, Dauno VIII, Dauno III, Dauno IV, Duro Conti 28, Senatore Cappelli, Dauno VI, Senatore Cencelli, Saragolla di Calitri.

Experiments have also been carried out at Portici to determine the critical periods with regard to soil moisture for barley, rye, flax, hemp, maize (for grain and fodder), French beans, soybeans and tomatoes.

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Notes.

I. GENERAL AGRONOMY.

Meteorology.

LONG PERIOD FORECASTING OF RAINFALL IN GREAT BRITAIN. — Dinsmore ALTER of the University of Kansas, U. S. A., has communicated the following results to the *Quarterly Journal of the Royal Meteorological Society* (London 1931, Vol. 57, No. 239, p. 198-201):—

(1) There is a definite periodicity in the rainfall of the British Isles.

(2) A reliable rainfall forecast can in future be counted on with a correlation coefficient of + 0.70.

(3) This correlation is sufficiently high for the forecasts to be of agricultural and economic value.

(4) Changes can be forecast for each half year in the coming 10 years as accurately as for the next six months.

The writer based his first results on a series of observations over 91 years, but now he has been able to obtain more precise and reliable results from a series of observations covering 203 years.

AVERAGE ANNUAL RAINFALL IN NEW ZEALAND FOR THE PERIOD 1891-1925. — Under this title M. E. KIDSON has published a report under the auspices of the Department of Scientific and Industrial Research of New Zealand, Meteorological Branch (Wellington, N. Z., 1930, 8 pp., 5 maps). It shows that in New Zealand the distribution of rainfall is governed by the topography and the prevailing west winds in such a way that most of the rain falls on the western slopes of the two islands.

As a result of shore winds the east coast receives more rain than the interior of the country. But the minimum rainfall tends to be produced near the coast in the neighbourhood of Cape Campbell.

The maximum rainfall (over 5030 mm.) falls on the high western parts of both islands. The minimum (less than 380 mm.) is observed in the low-lying region on the southeast of the southern island.

In no part is the number of rainy days excessive.

The maps show the distribution of the rainfall recording stations, soil relief, the mean number of rainy days at the recording stations and the annual averages in the two islands.

T. B.

Soil Science.

CONTENT IN ELECTRODIALYSABLE BASES OF SOILS IN CZECHOSLOVAKIA. — A series of investigations made with a special implement constructed by himself is described by M. I. SMOŘÍK in the *Věstník Československé Akademie Zemědělské* (Bulletin of the Czechoslovakian Academy of Agriculture, Prague 1930, Vol. VI, Fasc. 6-7, pp. 645-646).

The various soils were electrodialysed by currents of 120-146 volts and of 0.15 amperes. The bases collected at the cathode were determined by titration. The content in replaceable bases was determined in the same soils by a solution of ammonium chloride. It was found that the two systems gave approximately the same results. Also by electrodialysis repeated several times in succession in the same soil practically equal results were obtained.

RESEARCH ON CERTAIN YELLOW SOILS OF INDOCHINA. — Little being known of yellow soils M. Marcel RIGOTARD has made a study of those of Indochina (*Revue générale des Sciences*, Paris 1931, tome XLII, no 10, p. 308-310).

The writer observes that the colour of soil and subsoil may differ, there being, for example, a red soil on a yellow subsoil, or *vice versa*.

In the yellow soils studied:—

- (1) Lime may be absent or present only as a trace.
- (2) Humus is not abundant, varying between 6 and 11 per 1000.
- (3) The clay content is less than in red soils (probably all of basalt origin) and than in grey soils.

(4) The firing loss and content in nitrogenous matter increase with the clay content. This fact is important because the colloidal properties of a soil, which are contributed by both inorganic and organic matter containing little or much nitrogen, are fundamental and of greater importance than the content in P_2O_5 , K_2O , CaO , etc., which can be corrected by fertilising.

Certain yellow soils of Indochina containing from 20 to 30 % of clay which are situated in regions receiving adequate rainfall or easy to irrigate, are of high agricultural value, although not equal to the rich red earths.

After completing his study of yellow earths with twenty physical analyses the writer comes to the conclusion that they are perhaps capable of producing high quality crops, but that their fertility depends on suitable crops being chosen.

FACTORS CONTRIBUTING TO THE UNPRODUCTIVITY OF THE ALKALINE SOILS OF ILLINOIS, U. S. A. — In the northern half of Illinois, as also in the States of Iowa, Wisconsin, Indiana, etc., there occur large stretches of these so-called alkaline soils which are more or less unproductive until potash salts are applied. Other soils in southern Illinois also require potash fertilizer, generally as a result of repeated crops of melilot.

In 1923 SEARS undertook at the Illinois Agricultural Experiment Station a series of experiments in the laboratory, under glass and in the field to determine the cause of the unproductivity and the action of the potash salts. The so-called alkaline soils are drained marshland, rich in nitrifiable organic matter and calcium carbonate. He discovered that 2 factors are mainly responsible. — (1) the non-availability of the potash, (2) an excessive accumulation of nitric nitrogen due to abundant nitrifiable organic matter and the presence of CaCO_3 .

In most of these soils the low availability of the potash is due less to a deficiency of K_2O than to the alkaline reaction produced by the abundant CaCO_3 .

The application of straw to these soils greatly increases their fertility, because the straw contains 1 % of potash soluble in warm water and because of its well known denitrifying action, which is shown by the fact that straw is much more effective than ash in increasing the productivity of these soils. For the same reason horse manure is more effective than cow manure, whereas in soils defective in available nitrogen the reverse is the case.

It is important that in these soils there should be a physiological equilibrium between the potash and nitric nitrogen. (*Soil Science*, Baltimore, 1930, Vol XXX, No. 5, pp 325-345).

SOIL MAPS OF LATVIA. — This map which was prepared by Prof Jānis VITINS of Riga has been reproduced on a small scale by *Die Ernährung der Pflanze* (Berlin 1931, Band 27, Heft 1, p 18-19). Six soil types are distinguished:—

(1) The first phase of soil development is represented by a zone of "rendzina" (calcareous humus soils) situated to the south of the Gulf of Riga along the southern frontier. The 'rendzina' overlie a marly clay. Their surface layer loses lime by leaching and becomes rich in humus.

(2) A continuation of this process leads to the second phase, the *brown soils*, the surface layer of which has lost all its lime and become even slightly acid. These brown soils form a zone to the north of the preceding and are flanked on the west by

(3) a band of soils of the third phase, *moderately podsolised* (leached), with an acid reaction.

(4) The most widely distributed soils are those of the fourth phase, the true *podsoils* (acid), which generally overlie marly clay or sand.

(5) Along the Duna as far as Riga there are podsoils containing a shallow *brown freestone* ('Orstein') horizon.

(6) In many regions the podsoils have been considerably *improved* by prolonged cultivation.

Soil Improvement.

USE OF CHEMICAL FERTILISERS IN BRAZIL. — After the initial period of forest clearing followed by extensive cultivation Brazil has gradually begun to feel the need of more intensive cultivation and therefore of fertilisers. The following figures (quoted from *L'Engrais*, Paris 1931, No. 5, p 153) show the quantities of imported chemical fertilisers from 1927 to 1929

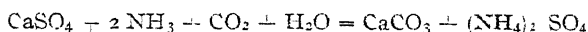
1927	1928	1929					
9911 tons	21 120 tons	24 220 tons from the following countries —					
		Germany	Netherlands	Belgium	Great Britain	United States	France
		15 314	3 671	2 006	1 942	1 111	108

IMPORTATION OF CHEMICAL FERTILISERS INTO NEW ZEALAND. — The chemical fertiliser imports into New Zealand in the two years 1928-29 and 1929-30 have been as shown below.

The figures show a tendency to increased importation. The "Imperial Chemical Industries" are proposing to open a large ammonium sulphate factory in New Zealand, which will probably lower the price of the fertilizer, which at present is high on account of freight costs. (*L'Engrais*, Paris, 1931, an. 46, No. 1, p. 17).

	1928-1929	1929-1930
	tons	tons
Ammonium sulphate	2 268	11 015
Natural phosphate from Oceania	178 057	170 997
" " Morocco	22 173	35 348
" " Tunisia	12 499	37 424
" " Egypt	6 000	300
Powdered bone and animal black	554	1 420
Basic slags	93 222	94 332
Superphosphates	1 037	525
Total	315 810	351 361

THE MANUFACTURE OF AMMONIUM SULPHATE WITH GYPSUM. — The 'Badische Anilin- und Sodafabrik' has invented a process for the manufacture of ammonium sulphate without using sulphuric acid. It depends on a reaction which was known as far back as LAVOISIER. When a mixture of carbonic acid gas (CO_2) and ammonia (NH_3) is applied to a suspension of gypsum in boiling water an insoluble carbonate of lime and sulphate of ammonia are produced according to the following equation:



This reaction makes it possible to transform synthetic ammonia into ammonium sulphate using gypsum instead of sulphuric acid, which greatly reduces production costs if a bed of gypsum is at hand.

The reaction takes place without heat in 2-3 hours; the gypsum is placed in 2/3 its volume of water and continually stirred. More gypsum is added during the reaction to obtain a more concentrated solution of ammonium sulphate. When the reaction is complete the insoluble calcium carbonate is separated and the solution concentrated to crystallisation.

The crystallisation liquors and those for washing the CaCO_3 are utilised again for diluting further supplies of gypsum.

The advantage of this process is that it can take place at ordinary temperatures and is thus economical. It is used on a large scale in Germany. (*L'Engrais*, Paris, 1931, an. 46, no. 2, p. 53).

The *International Review of Agriculture* has already (1928, No. 10, p. 878) reported another process for using gypsum for the manufacture of ammonium sulphate, which was described by Paul BAUD in the *Comptes rendus de l'Académie des Sciences*, Paris, 1927, tome 185, No 21, pp. 1138-1141.

WEED-KILLING FERTILISERS. — M. JAGENAUD, Director of the Agricultural Services of the Tarn, France, reports certain complete fertilisers which play a double role and act as effective weedkillers as well as being more beneficial to cereals than ordinary complete fertilisers.

The best known weed-killing fertilisers are powdered cyanamide and the special sylvinit, applied together or singly. Their use however is liable to the drawback of upsetting the balance of fertiliser elements. Either potash or nitrogen in excess may be harmful as well as being an unnecessary expense.

To avoid this drawback M. JAGENAUD has developed a formula for a complete fertiliser which is carefully balanced as regards the nitrogen, potash and phosphoric acid. This weedkiller is made up of powdered cyanamide, poor sylvinit and finely ground natural phosphate of calcium. The three ingredients require to be thoroughly mingled and crushed so that the mixture can be spread as a fine powder. In double bags of impermeable paper this mixture can be stored without decomposing or becoming lumpy.

The mixture is applied (by hand or by a spreader) when dew, or preferably a white frost, is on the ground, between December and March in central Europe. The amount to be applied varies according to conditions from 800 to 1200 kg. per ha.

This fertiliser is less costly than normal fertilisers, is simple in use, is an effective weedkiller, increases the yields of cereals by as much as 3 or 4 times as compared with control plots. (*L'Engrais*, Paris, 1931, an. 46, no. 2, pp. 47,49).

T. B.

II. CROPS OF TEMPERATE REGIONS.

EFFECTS OF LIGHT AND DARKNESS ON PLANT GROWTH. — The *Journal of Agricultural Research* for May 1931 contains an interesting article on this subject by W. W. GARNER and H. A. ALLARD. Some of the main points are the following.

If the continuity of daily illumination is broken by plunging the plants into darkness for 1-2-5 hours a day the general nutrition and growth are injured; but this reduction in illumination has no more influence on reproductive capacity than if the early and late illumination is suppressed during the long summer days.

These first experiments were carried out using the sun as source of light.

In a further experiment the development of a number of plants of different species was followed when submitted to alternating periods of light and darkness of length varying from 6 hours to 5 seconds, a Mazda lamp of 1000 watts served as the source of light. The plants in the experimental chambers were well ventilated and the temperature was slightly lower than that of the summer atmosphere. In most cases the periods of illumination and darkness were equal. The multiplied differential effects of the alternations on general nutrition and growth were in striking contrast with their comparatively uniform action on the time of flowering.

As the equal intervals of light and darkness, starting with a 6 hours' duration, diminished it became increasingly evident that there was mal-nutrition and retarded growth, the maximum defects in nutrition and growth were observed when the alternation was no longer than one minute. If the duration is reduced beyond this point an improvement in nutrition and growth occurs, so that with a 5-seconds alternation as good results were often obtained as with 12 hours. Between these extremes the alternations caused an apparent destruction of the chlorophyll, general etiolation, localised killing of the leaf tissues, reduced development of the leaf, reduced lengthening of the stem and reduced production of dry matter.

When the illuminated intervals were reduced to half the dark intervals the unfavourable effects of the alternations within the limits stated above became so intense that the greater number of the plants were rapidly killed.

On the other hand if the illuminated intervals were double the dark intervals in each cycle, a general improvement was observed in the appearance of the plants; it seems that this increase of the duration of illumination in proportion to the duration of darkness surpassed the retarding action of the alternations on growth.

As regards the action on flowering, the fact that a given plant belongs to a long day type or to a short day type seems to have more influence on flowering than the duration of the alternations. In general alternations of 6 hours and less favoured the flowering of long day plants and were unfavourable to short day plants.

FROST RESISTANCE IN WHEAT AND OATS. — The *Journal d'Agriculture pratique* (6 June 1931) publishes a note on this subject communicated to the Agricultural Academy of France by M. CRÉPIN, Director of the Genetics Research Station of Dijon.

The technique employed for determining the precise action of frost on the cereals studied is explained. This action differs according to the severity of the temperature, the date of seeding and the temperature conditions to which the plant has been exposed previous to frost injury. The purpose of the investigations was to find high yielding wheats capable of growing in regions where hitherto the rigours of winter have prevented the cultivation of wheat. This end seems already to have been attained. In the region of Dijon, one of the most favoured districts of the east, high yielding wheats are grown which have produced natural hybrids with unselected wheats. M. CRÉPIN has harvested aberrant ears from these unselected wheats and has followed them up genetically and has found one which combines qualities making it an ideal wheat for mediocre and poor land wherever winter frost and summer drought are liable to occur.

The new wheat, named P.L.M. 1, was grown in bulk this year on 10 ha. at the Plant Improvement Station at Epoisses and the resulting crop will be sufficient for the wheat to be made available to the Agricultural Offices this autumn.

Other frost resistant types are under study; several possess a resistance to lodging comparable to that of the high-yielding wheats such as 'Hybride inversable'. The best of these varieties will later be made available for cultivation as frost-resistant varieties for rich soil.

NEW RUSSIAN WHEATS WHICH WILL NOT SHRIL OR SHATTER EASILY. — In connection with the development of large scale production of wheat on the Soviet-owned farms

(sovkhozi), the question of selecting varieties which will not shell or shatter becomes of great importance. Experiments carried out in western Siberia during 1930 showed that while some varieties shattered or shelled as much as 19.6 %, other varieties shattered only 2-3 %. An effort is now being made to discard all the high-shelling varieties and adopt those which show low-shelling. Among these the following Russian varieties, Blansar, Sarrosa and Sarrubra, developed by the Saratov Station, have shown the lowest percentage of shelling. 'Aone', the American variety Kubanka has also shown a low percentage.

During 1931 the tests are being continued and in addition to the Russian varieties several American varieties will be introduced (*Journal of the American Society of Agronomy*, April 1931).

CENTRE FOR STUDYING OLIVE VARIETIES IN FRANCE. — In consequence of the number of varieties of varying quality grown in France it has been thought advisable to organise a Centre for the study of olive varieties and the subsequent distribution of grafts of satisfactory varieties.

The Centre has been formed on the "Bel Air" estate near Montpellier. On an area of 5 hectares have been planted about 80 varieties of olives selected with a view to the following:—

- (1) Selection of all the best types of table olives
- (2) Selection of 20 to 25 of the best oil yielding olives.
- (3) Elimination of all olives of doubtful quality or purpose.
- (4) Introduction into France of the best foreign varieties.

There are at present at the Centre 20 Italian, 10 Spanish and Portuguese and 8 African varieties. In the spring of 1932 the Centre will receive varieties from Greece and Asia Minor.

This experiment plantation will be of use to olive experts as well as to growers.

D. K.

TROPICAL AND SUBTROPICAL AGRICULTURE

Lac and Lac Refining.

Lac is the resinous secretion of certain insect parasites of various plant species. The principal lac insect is a relative of the cochineal insect, belonging to the Coccidae, *Tachardia lacca*, also called *Carteria lacca*, after the scientist CARTER who studied its life history at Bombay in 1860.

There are about 30 species serving as hosts of the lac insect; they are mostly shrubs or trees which had not until recently been cultivated. The main species are:— *Combretum Boveti*, *Cupania trijuga*, *Dalbergia* spp., *Schleichera trijuga*, *Ficus* sp., *Butea frondosa*, *Pithecolobium Saman*, *Cajanus indicus* and *Zizyphus jujuba*.

Traders in lac have found that it is more profitable to produce it in a cultivated plantation than to collect it from scattered wild trees. The choice of the best host has been guided by the climate. In Cambodia and Laos the selected shrub is *Combretum Boveti*, which grows on dry or flooded land. The lowest stems are pruned every two or three years in order to obtain an increased number of branches without too wide a diameter. In Siam *Pithecolobium Saman* and *Cajanus indicus* are preferred. The former is used particularly in the district of Chiangmai. It is self-propagating and grows rapidly; if the soil is friable and fresh the tree can be utilised after 5 years. The trees are planted 20 metres apart because the foliage is thick and the lac insects require light and air. *Cajanus indicus* is used mainly in the region of Bayale. The trees live only 3 or 4 years; they become productive after 2 or 3 years; in some parts they are spaced at 2m, in others at 4m.

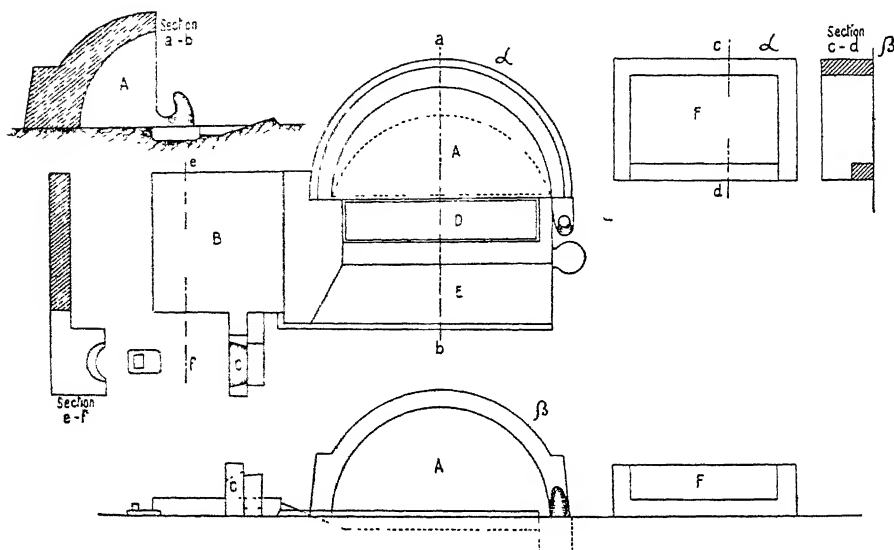
Crude lac, or stick lac as it is called, is in the form of dark red incrustations of varying thickness on the twigs. If a transverse cut is made through an incrustation

the insects may be seen with a magnifying lens. The females produce bright red larva which fix themselves in groups on the twigs and form new colonies.

To allow the lac insect to propagate freely it is necessary to keep the trees clean and cut away any dead or even old branches and climbing or epiphytic plants. This is to keep away ants which are the worst enemy of *Tachardia lacca*.

Seed lac, for artificial propagation, must be chosen from thick, reddish and vesicular incrustations; the incrustation must be fresh and the insects on the point of swarming. In Siam and India there are two swarms and therefore two generations a year, in Laos and Tonkin only one.

PLATE I. — Furnace for lac refining.



A = Furnace in plan, section and elevation.

B = Platform for overseer.

C = Bottle support.

D = Blast pipe.

E = Inclined hearth.

F = Lateral Furnace.

Grading of lac. — In Siam and Indochina lac is graded according to the size of the incrustations irrespective of quality, i. e., without taking into account the tree from which it is obtained. Lac containing large quantities of dust is however considered of poor quality. On the Bangkok market lac is classed in 2 grades:— northern lac and eastern lac. The northern lac is the more highly valued.

In India lac is classified as follows:—

(1) Lac from *Schleichera trijuga*, the most valuable on account of its light colour.

(2) Lac from *Butea frondosa*, of medium quality, red and variable in colour.

(3) Lac from *Cajanus indicus*, considered of poor quality.

Refining. The operations during refining are crushing, sifting, washing, drying, second sifting, pulling and melting.

The stick lac is crushed with hammers on an iron platform and as much as possible of the woody matter removed. The crushed lac is then sifted to remove fur-

ther foreign matter, and the larger lumps of lac again crushed until they have attained the desired size. No special machine has yet been invented for this work.

The granular lac thus obtained is washed for the production of shellac or button lac. It is soaked in water over night (1) to allow any remaining foreign matter to rise to the surface, (2) to soften the lac and (3) to give it its full colour. The colour after immersion in water is dark wine red.

After washing the lac is put into stone vats shaped like inverted cones having a capacity of about 100 litres. The inner surface of the vat is rough. Water is poured in to cover the lac and is continually renewed. Then a worker holding on to a horizontal bar at a convenient height works the mass vigorously with his feet

PLATE II. — *Tools and accessories used in lac refining.*

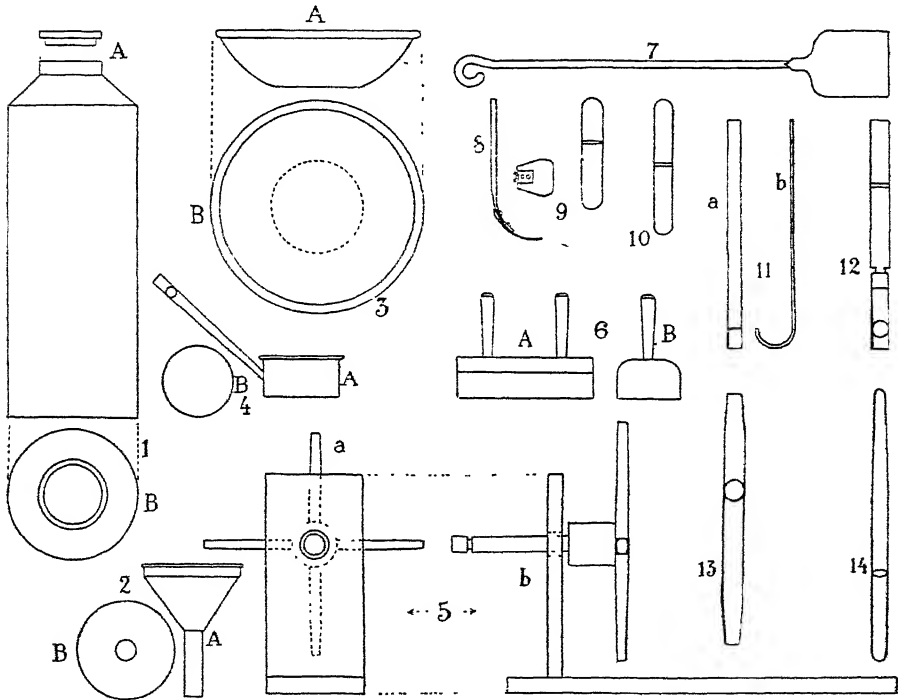


FIG. 1. = Bottle into which the melted lac is poured.

FIG. 2. = Funnel for pouring lac into the bag.

FIG. 3. = Stoneware pan placed at the right of the worker containing the required water.

FIG. 4. = Cast iron plan for washing.

FIG. 5. = Wooden turnspit for turning the bag in front of the furnace (a = front view, b = lateral view).

FIG. 6. = One of the 6 or 12 wooden supports placed about 1m. apart to hold the bag so that it can turn freely.

FIG. 7. = Iron shovel for attending to furnace.

FIG. 8. = Iron scoop for removing scum.

FIGS. 9 and 10. = Iron spatula for transferring melted lac from the bag into the bottle.

FIG. 11. = Hook for preparing the so-called 'bajoo' (a = front view, b = lateral view).

FIG. 12. = Iron spatula with wooden handle for replacing melted lac which runs out of the bag.

FIG. 13. = Wooden implement for opening the bags.

FIG. 14. = Bamboo stick (preferred to the iron spatula of fig. 12) used in preparing button lac.

and legs for at least half an hour. This operation is repeated two or three times until the lac has become orange coloured.

The lac is then put on a cement floor to dry in the open. The usual precautions are taken to ensure rapid and uniform drying. The dry lac is put into long bags 7 or 8 cm. in diameter made of a material strong enough to stand the twisting that occurs during the heating and melting of the lac. For the button lac it is difficult to obtain a suitable material for the bags, but for shellac there are ideal materials available.

The lac for both shellac and button lac is treated similarly up to this stage.

Shellac. — Shellac is a good quality lac which after fusion has been treated so as to produce transparent flakes. The details of the tools and appliances used are shown in the two plates. Each furnace can produce 35 to 40 kg. of shellac per day.

Button lac. — Button lac is as pure as shellac but instead of being in flakes is in the form of small irregular-shaped pieces 4 or 5 mm. in thickness.

The furnace is similar to that used for the preparation of shellac (represented in Plate I) but is rather smaller. The bags are also narrower. Good quality button lac should be light chestnut in colour with a very fine grain.

Refined lac whether shellac or button lac offers large advantages over stick lac, chiefly in that it can be kept indefinitely without deteriorating. Stick lac is liable to be attacked by insects and diseases and is very sensitive to changes in temperature.

J. LEGROS.

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AGRICULTURAL ENGINEERING

The Combine Harvester-Thresher (1).

Agriculture in most countries is now undergoing fundamental changes. Post-war economic difficulties have resulted in a great development of the use of machinery, and machinery to give its best results requires conditions entirely different from those of the agriculture of the old countries with its complicated organisation and broken up farms. Machinery requires large surfaces devoted to one crop, such as are not readily found in the regions of intensive agriculture. Thus mechanisation often causes movement towards the regions of extensive agriculture. A clear example of this is seen as a result of the use of the combine in grain growing.

(1) See also, this *Bulletin*, 1928, No. 9, pp. 811-814; 1929, No. 4, pp. 155-158.

DEVELOPMENT OF THE COMBINE. — The origin of the combine harvester-thrasher goes as far back as 1830. It was already in use then in Canada but was too little developed to take root and disappeared from the market. Without any connexion with the Canadian machines there appeared about 1840 in Australia strippers which were smaller and more suited to the size of the Australian farms; they obtained popularity and were later exported on a large scale to Argentina.

Quite independently of the Australian machines the combine reappeared in California about 1860; by 1880 between five and six hundred of these machines were already in use. A favorable climate permitting of the ears being left on the stalks until completely dry, the extensive farms and the shortage of labour during the short harvest season all contributed to promote the use of combines, although at this time they were still rather heavy, required whole teams of horses to pull them and the power for the reaping and thrashing was transmitted from the wheels.

A step forward was made when steam was introduced as the motive power.

But the combine did not come to dominate world agriculture as it now does until after the development of the tractor. The tractor serves both for traction and for the direct transmission of power to the machine.

TYPES OF CONSTRUCTION. — As its name implies the harvester-thrasher combines the work of reaping and thrashing. Consequently the corn is no longer stooked, and need not be because it is no longer reaped before it is completely ripe. Reaping is effected with ordinary knives; the blades are grooved on the upper surface of the cutting edge to enable them to keep sharp without sharpening. The length of the cutter bar is 2.4 — 4.2 — 6m and over. The average rate of harvesting is from 0.1 ha. per hour for a cutting width of 2.4 m. to 1 ha. per hour for a width of 4.2 m.; with larger machines the rate is proportionately higher. The cutter-bar is adjustable to leave a stubble length of from 15 to 70 cm. A reel above the cutter-bar drives the corn against the knives so that when cut it falls regularly on to the canvas belt, the width of which in existing machines (0.8-0.9 m.) is adapted to the conditions of the combine harvesting regions. For European countries which utilise the straw the canvas would be needed wider.

The drum is comparatively small in combines. One reason for this is that in the regions where they are used the corn yield is low and little straw is cut, a further reason is that in the combine the cut corn is laid in a regular layer on the platform instead of being thrown in in irregular sheaves as in a stationary thrashing machine.

The grain is beaten and rubbed from the ears in the drum and then separated from the straw by fans and shakers. This part of the work is in general done as in ordinary thrashing machines. In most combines there is also a contrivance for keeping the thrasher horizontal on hillsides so as to ensure thorough cleaning. At the present time the grain is generally emptied into a trailer; certain makes however are provided with a grain tank above the machine. Sacking attachments are not much used.

Combines are built mainly in the United States. Unfortunately little comparative criticism of the various types and their results has been published. Some comparative tests have been carried out in Russia in connexion with the Five Year Plan. In the United States only good is for the most part spoken of the machines, but comparative trials would be useful and interesting.

The best-known combines are the following, which all exist in several different makes:—Advance-Rumely, Avery, Allis Chalmers, Baby Combine, Borodin, Case, Caterpillar (Holt), Curtis, Centrifugal Combine, Clayton, John Deere,

Douilhet, Frost & Wood, Gleaner Baldwin, Harris, McCormick-Deering (IHC), Massey-Harris, Minneapolis-Moline, New-Way Harvester, Oliver Nichols & Shepard, Sunshine, Wood Bros. Such comments on certain of these types as are obtainable will be briefly given.

Advance-Rumely. — The machine is of simple construction but little perfected. Lubrication is not uniform. The distribution of the weight is good, also the construction of the automatic brakes and the cutter bar raising device. The machine is not convenient to handle however and is not well enough made to guarantee a long life.

Allis Chalmers Baby Combine. — As its name implies this make is suitable for small farms, the cutting width being only 1.5 m. The cutter-bar is directly in front of the machine and the straw and grain are delivered straight to the drum. The drum has instead of the usual teeth a cylindrical wire brush making 1000 revolutions per minute. The machine is of very simple construction and is worked direct from the tractor. Its weight is 13-14 quintals.

Borodin. — A Russian machine, not yet fully perfected. Although this combine was passed by the Agricultural Academy of Timirjasev at Moscow in 1929 as giving good results and has this year been turned out in mass production at the factory which has been opened at Saratoff, trials in Germany showed that it is not yet adequately developed for manufacture. The interest of the machine lies in the principle on which thrashing is effected and its saving of power in comparison with usual methods. The drum is fitted with metal slats like flails which are driven by centrifugal force against the concave but are able to yield on meeting greater resistance. The concave consists of toothed rollers. The complicated construction of the thrashing apparatus probably means that it will not wear well. Tests have shown that a faultless thrashing is rarely obtained. An advantage of this machine is its relative independence of length of straw, the drum of 1.3 m. being fed directly by the canvas. With short straw however it is a drawback that the drum is only partly filled.

Caterpillar. — This combine (previously called Holt) is of very simple and good construction and has the parts well arranged. The brake lever is inconveniently placed, but otherwise the machine is easy to handle and absolutely safe. It is durable and works well.

Curtis Centrifugal Combine. — In a previous article (1) was mentioned the proposed use of an axial conical drum. This idea has been developed in the centrifugal combine of Curtis Harvester Inc., North Kansas City, Mo, put on the market in July 1930. The machine blows out the straw and tailings by means of an air blast. There are no shakers or riddles and only one sieve. The drum is only 20 cm. in length; it is completely surrounded by the concave and gives as high an output of grain as the orthodox drum of 150 cm. The advantages of this combine are that it can be manufactured comparatively cheaply and that it is not affected by hilly ground.

Demonstration trials gave very good results. The machine worked well in fields with sparse and heavy crops and with short and long straw. Grain losses were less than with ordinary machines and the grain was clean and undamaged.

Clayton. — This is an English combine of the ordinary type which was built in large numbers for export to South America and has recently been fitted with bar beaters and tested in England.

(1) See this *Bulletin*, 1929, No. 4, pp. 155-158.

Douilhet. — The DOUILHET combine, of Caudéran-Bordeaux, which has been mentioned several times previously in this *Bulletin*, represents an attempt to adapt the principle of the American machines to French conditions. The cutter-bar is the same as in ordinary reaper-binders. The machine is drawn by a 10-20 HP tractor and has a 20 HP engine to work it. A canvas belt carries the grain and straw to the drum, which is of the beater type. The grain and tailings pass from the concave to an elevator. The unchaffed straw passes to a binder and is ejected in sheaves.

Cleaner Baldwin. — The main advantage of this make is in the position of the cutter-bar in front of the machine. The thrashing mechanism and the grain tanks are at the sides, making it possible to reverse the machine. It is difficult for the driver, surrounded on three sides by the parts of the combine and sitting among clouds of dust, to control the work of the tractor, the cutter-bar and the thrasher.

McCormick-Deering (IHC). — The varying reports on the results given by this machine indicate its complication and the inconvenience of its handling. There are however people who say that it gives very regular work and others who acclaim its solidity. It is not well adapted for cutting short-strawed crops.

Oliver Nichols and Shepard. — This combine resembles the Caterpillar in construction but is somewhat inferior to it on account of its less solid make. Apart from this its working is simple and safe.

Sunshine. — This type, which is widely used in Australia and has given good results there, has recently been manufactured also in Canada. The model is slightly modified from the Australian Sunshine. The cutter-bar is in front. There is a single engine serving for locomotion as well as reaping and thrashing. At demonstrations carried out at the Swift Current Experiment Station, Saskatchewan, difficulties were found to be caused by the fingers being too wide apart. It is moreover feared that the single engine may not execute its several functions properly on difficult land or with a heavy crop.

New-Way Harvester. — This new harvester which is in use in the United States and Canada is not, properly speaking, a combine, there being no thrashing. The corn is delivered by an elevator to a stack-container or hopper and is eventually dumped in stacks along the field, the stacks being from 10 to 12 feet in diameter. The stacks stand well in any weather and when required can be removed by a special sweep for subsequent thrashing. The advantages of the machine are that the straw is saved, weed seeds are not returned to the soil and harvesting can be begun as soon as a binder could be used. The machine works satisfactorily but is costly because its purchase price is high and it is in use only during a short season of the year. The price is nearly that of a small combine.

Windrowers and pick-up attachments. — In the regions of America where a heavier rainfall makes harvesting with the combine too great a risk a windrow attachment on the combine is used and some days later the windrow is collected with a pick-up attachment and thrashed. By this method the corn is cut at the usual time and also a badly weed infested field can be successfully harvested because the windrow rests on the stubble which is left high (not shorter than 20 cm.) and so is in a good situation for drying. In many parts of Canada and the United States windrowing is more usual than combining, though it may be said that in general the former is done only when combining is not possible.

GRAIN LOSSES. — In the combine using countries much study has been devoted to grain losses. The results naturally vary within very wide limits accord-

ing to the climate, the condition of the fields, the degree of maturity, the variety of corn grown, the skill with which the work is done, etc. Comparative tests of combines and other machines under the same conditions have for the most part proved the superiority of the combine. In Canada it was shown that grain losses with the combine are nearly one-third of those with other harvesters. Investigations made in Argentina in 1927-28 by the Ministry of Agriculture show that the respective losses with the combine, the binder and thrasher and the stripper and thrasher are in the following ratio:— 9.1 %: 14.3 %: 16 %.

A detailed study made in Germany in 1929 and 1930 by the *Reichskuratorium für Technik in der Landwirtschaft* (Agricultural Engineering Council of the German Government) of grain losses with different harvesting methods gave the following results:—

Losses by shedding before harvesting commences are greater with the combine than with other harvesters if the variety is liable to shedding but are negligible with tight-chaffed varieties.

Reaping losses depend largely on the length of straw. With the same height of stubble less grain is lost with the combine than with the binder, but with increasing height of stubble left by the combine the cutting losses increase.

Thrashing losses are on the whole greater with the combine than with stationary thrashing.

Losses due to the binder and during stooking and carting are eliminated by the combine.

Thus it results that, provided suitable varieties are grown in clean fields, and that certain modifications are made in structure, the combine can be developed to become, even in humid regions, the best harvesting system as regards total loss of grain.

THE COMBINE AND THE STRAW PROBLEM. — The straw harvest is of importance only in countries where stock-breeding is an essential part of farming. In the regions now using combines the straw is of little account and consequently the machines produced lack straw collecting devices.

Where straw is valued the construction of the drum depends largely on the purpose for which the straw is required. Straight straw requires bars, bent straw is produced by a peg drum. The latter, which is more economical and easier to manipulate, is found in most combines. Until quite recently the superiority of the bar drum was insisted on, specially in Germany, but now it has been stated that bent straw is quite as serviceable as straight.

The best method of collecting the straw left by the combine has not yet been found. Although from a technical point of view the use of a hay-sweep and moving baler is feasible it is considered too costly. Perhaps a simpler method is that of the moving hay-baler which is doing satisfactory work in America. This machine, which is worked directly from the tractor, is a combination of the moving hay-baler and a lateral pick-up attachment very similar to that in use in the moving thrasher. Another possibility is the picking up of the straw directly behind the combine as is done by a DOUILLET machine which throws the bundles of straw behind it. If the straw is dry enough a composite baler and combine is ideal for regions which need to utilise the straw.

QUALITY AND DRYING OF COMBINE-HARVESTED GRAIN. — When the combine first came into use there were complaints about the quality of the grain. It was found however that the fault lay not in the machines themselves but in the far-

mers' lack of experience with the machines, for they were harvesting too early. When this mistake was rectified the complaints soon ceased.

In countries with a wet climate it will without doubt be impossible to separate the problem of the use of the combine from that of the artificial drying of grain. Grain drying has been thoroughly tried out in Canada, but grain driers are installed only at the big elevators. Apparently small-scale driers are not profitable. A good deal of experimental work in grain drying is being carried out notably at the University of Saskatchewan at Saskatoon and at the State Agricultural Colleges of North Dakota and Illinois and in Europe at the Institute of Agricultural Engineering at Oxford and under the Agricultural Engineering Council of the German Government. No decisive results have however yet been reached.

USE AND FUTURE OF THE COMBINE. — Combines are in use mainly in the United States, Canada, Australia, Argentina and North Africa and have recently been introduced in Russia. The principal producing firms are in the United States. The following tables give an idea of the increasing use and distribution of combines.

TABLE I. — *Number of combines manufactured in the United States from 1914 to 1929 and their value from 1929.*

Year	Number	Year	Number	Value in 1000 dollars
1914	270	1926	11 760	15 863
1921	5 027	1927	18 307	26 885
1923	4 012	1928	25 392	35 603
1924	5 828	1929	36 957	50 684
1925	5 131			

TABLE II. — *Development of the exportation of combines from the United States from 1926 to 1929.*

Destination	1926		1927		1928		1929	
	Number	Value in 1000 dollars	Number	Value in 1000 dollars	Number	Value in 1000 dollars	Number	Value in 1000 dollars
France	46	43	23	22	52	75	16	17
Germany	—	—	1	2	16	18	27	16
Russia in Europe	4	5	—	—	33	6	435	701
Spain	5	4	24	33	31	40	41	50
Canada	368	337	819	1 035	3 560	5 473	3 013	4 757
Mexico	26	27	58	81	49	71	67	98
Argentina	3 637	2 408	3 097	3 570	3 116	4 172	6 214	8 607
Brazil	3	3	1	1	3	4	64	148
Chile	50	59	19	21	31	42	108	60
Uruguay	26	32	153	134	150	179	294	331
Philippines	3	9	—	—	5	5	30	28
Australia	97	80	261	260	3	5	37	22
British East Africa	10	14	55	59	51	34	206	56
British South Africa	1	1	1	1	6	6	14	17
Algeria and Tunisia	80	77	101	143	88	131	293	362
Morocco	58	42	23	24	62	124	110	153
Other countries	25	28	75	92	61	65	97	66
	4 444	3 165	4 705	5 476	7 317	10 449	11 071	15 586

The figures of the export from the United States give a general idea of the numbers used in the different countries with the exception of Australia. Australia has from the beginning followed an independent line in the matter of combines and supplies the demand with her own manufacture. The harvesting machines used in Australia are mainly combines and strippers.

The large number of combines shown in Table II to have been exported to Argentina is interesting. In this country whose climate and farming conditions are particularly favourable for the use of the combine 30 % of the wheat was combine harvested in 1929. Even in comparatively small farms the combine is found economically superior to separate cutting and thrashing. Where it is sufficiently in use its superiority is so great that it has been adopted whatever machines were used before. There is no doubt that shortly no other method of harvesting will be used in Argentina.

Wherever the conditions of climate and land are favourable the combine proves its superiority over every other method of harvesting. In countries where labour is dear the combine reduces production costs and so guarantees a sure profit even with low prices.

Countries, therefore, which are unable on account of climate or systems of holdings to make use of the combine, find themselves at a disadvantage. Hence they are anxiously studying methods of adapting the machine to their conditions. The experiments at Oxford and in Germany have already been referred to, and others are being carried out in France and elsewhere. It seems that a practical solution is being found, particularly in Germany.

SUMMARY. — It may be said that the combine in its different forms makes possible a truly remarkable economy in harvesting. Its dependence on climate has been partly overcome as regards practical technique by perfecting its method of use ; but, from an economical point of view, the more arid regions will always have an advantage.

Since the development of the smaller machines the importance for the combine of large acreage has diminished. The use of the combine, together with that of the tractor, tends however to increase farm acreage. It is obvious that a system of mechanical harvesting applied to an already mechanised cultivation system should, to produce maximum results, require as extensive an acreage as possible under a single crop.

This leads on the one hand to the forming of immense ' corn factories ', such as are coming into being in Russia, and on the other to co-operation between small and medium sized farms for tilling and harvesting with machinery owned in common, as is seen in the Russian collective farms and also, with greater or less success but without their political and social implications, in the experiment being tried in a small village community in Germany near Ulm, in Swabia.

The use of the combine and the tractor is bringing about fundamental changes in modern agriculture. These changes are still only in their infancy and the numerous imperfections and exaggerations observed to-day will doubtless disappear.

H. J. HOFFEN.

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ANIMAL HUSBANDRY

Notes.

General.

AN APPARATUS MAKING IT POSSIBLE TO DETERMINE IMMEDIATELY IN PERCENTAGES THE VARIOUS BODY MEASUREMENTS OF LIVE STOCK. — In the periodical *Mesogazdasági Kutatások* (Budapest 1930, No. 12) Dr. L. URBANEK, who is on the staff of the Zootechnical Institute of the Veterinary College of Budapest, describes an apparatus of this type making calculations and the employment of tables unnecessary.

Horses.

REGISTRATION OF HEAVY GERMAN DRAUGHT HORSES IN THE BELGIAN HERD-BOOKS. — The Royal Society "Le Cheval de Trait Belge" has agreed on the following conditions to the request made by the Administration of the German Studs relating to the registration of stallions imported from Germany.

"A Belgian Committee will first examine the pedigree of the stallion proposed for registration and subsequently its physical conformation. The registration will be exclusively reserved for stallions entered in the German Studbooks, which accept on the same conditions the registration of Belgian horses. (*Le Cheval de Trait Belge* 1931, No. 377).

Cattle.

FEEDING TRIALS OF DAIRY COWS WITH RAW POTATOES AND WITH STEAM COOKED POTATOES, IN GERMANY. — The "Reichsarbeitsgemeinschaft", or Co-operative Association for the Reich, of zootechnical Institutes and Research Stations in Germany carried out during the winter of 1929-30, in five zootechnical institutes (Göttingen, Halle, Jena, Breslau-Tschechnitz, Kiel) the following trials on uniform lines, which are described by Prof. ZORN in the *Mitteilungen der Deutschen Landwirtschafts-Gesellschaft* of 1931, Part 7.

During the trial period, the potatoes were treated like mangolds and silaged fodder; they were fed to stock partly raw and partly steam-cooked.

Taking the average result of the trials, feeding with potatoes produced only a trifling diminution in the milk yield, of no importance in comparison with the great economic advantage of this method of feeding. The percentage of butter fat was affected only in a few cases.

Reports on these trials show that the feeding of raw washed potatoes up to 15 kg. daily ration per cow presents no difficulty; the animals must however become gradually accustomed to the feed. They accept less readily the steamed potatoes, but it is possible also to reach the daily ration of 15 kg. In any case, for potato fed cows it is necessary to increase the straw ration if the animals are to feel properly satisfied.

Pigs.

INSTRUCTIONS FOR YIELD TRIALS OF PIGS, IN GERMANY. — The President of the *Deutsche Landwirtschafts-Gesellschaft* has published the following instructions in regard to these trials:—

1. Breeders are expected to submit all the pigs of their herds to yield trials.
2. There is to be understood by the number of young pigs in one farrowing, the whole number including those born dead if properly developed.
3. The date of a farrowing is taken to be that on which the last piglet is born.
4. For every registered sow, the number of piglets at each farrowing, and the weight of each at the age of 28 days will be entered.
5. Determination of the weight of the young pigs at birth or at time of sale is optional.
6. In estimating yield, that of the mother sow alone will be taken, excluding the foster mothers.
7. There must be present, in boars and sows, at least twelve nipples, evenly divided (6 + 6).
8. Young pigs which have too few nipples, or animals which for any reason are not to be used for breeding purposes must be nicked in the front lobe of the left ear.
9. All returns must be checked by a person known by the competent Chamber of Agriculture to be independent. (*Mitteilungen der D. L. G.*, 1931, Stück 5).

Sheep.

EXPERIMENTAL, SLAUGHTERINGS OF FAT LAMBS IN GERMANY. — The *Deutsche Landwirtschafts-Gesellschaft* and the *Reichsverband für Deutsche Schafzucht* (Association of the Reich for sheep breeding in Germany) have recently organised investigations into the condition of live lambs and their estimation in accordance with the market rules for slaughtered stock at Berlin.

For price estimation, lambs conforming to the Berlin standard are placed in the first class, a difference being established between the winter standard (October to April, 60 to 75 pounds weight in the fold) and the summer standard (May to September, 70 to 90 lbs.).

Lambs conforming to the winter standard which are ready for killing should not be really fat and should supply lean meat for roasting mainly. On the other hand, lambs conforming to the summer standard should supply meat for boiling with vegetables and should have a larger quantity of muscular fat.

There should be submitted to trial five lambs from each breeding flock and five from each flock for sale. (*Mitteilungen der D. L. G.* 1931, Stück 15).

FORMATION OF A NEW SHEEP BREEDING CENTRE IN FRANCE. — The Administrative Council of the *Union ovine de France* has decided to consider the formation of a new centre for sheep breeding for the Southern region of the Central Massif and of the Southwest. This will bring up to three the number of the centres of this kind formed by the Union, taking into account the one already in working order for the Île de France and the central one which is to be shortly opened on the Domaine de Merle on the Bouches-du-Rhône. (*L'Union ovine*, 1931, No. 1).

THE WOOL RESEARCH LABORATORIES OF THE SHEEP BREEDING UNION OF FRANCE. — The *Union ovine de France* has established a wool research laboratory, and has appointed M. Andre M. LEROY, Head of the zootechnical section of the *Institut National Agronomique*, as director.

The main objects of this Laboratory are as follows:—

1. Determination of the wool value of the principal breeds of sheep bred in France and in the French Colonies. Study of the influence of the conditions of production (soil, climate, feeding) on wool qualities.
2. Investigation of the most rapid methods for determining the wool qualities of sheep intended for breeding purposes.
3. Systematic investigation of the laws in accordance with which wool qualities are transmitted by rams and ewes to lambs
4. Organisation of the supervision of wool production, in connection with the Herd-book Associations. Establishment of selected families having meat production and wool production aptitudes harmoniously balanced.
5. Determination of the relations that may exist between the wool aptitude, the milk and cheese aptitude, the development of weight in function of time, the conformation and the fattening aptitude.

Poultry.

INSTITUTION OF A REPRESENTATION OF POULTRY FARMING INTERESTS FOR THE REICH IN GERMANY. — The Central German poultry farming organisations have set up, in the form of a cooperative society, a *Reichsinteressenvereinigung der Geflügelwirtschaft* (R. I. G.) with head-quarters at Berlin-Dahlem, which represents the interests of German poultry farmers, especially for the essential economic questions.

The importance of this new organisation will be recognised when it is remembered that Germany possesses about 98 millions of poultry worth 300 million Reichsmarks, distributed among four million farms and supplying yearly products the value of which exceeds one milliard Reichsmarks, and meeting nearly four-fifths of the needs of Germany.

The R. I. G. is always ready to give information relating to technical and economic avicultural questions. (*Communication from the Secretary of the R. I. G. to the International Institute of Agriculture*).

AVICULTURAL QUESTIONS DEALT WITH BY THE ITALIAN "CONSIGLIO NAZIONALE ZOOTECNICO" AT ITS MEETING OF 8 MAY 1931. — Prof. GHIGI (Bologna) presented a report of which the following are the chief points:—

In Italy, there are at present 32 State model poultry-farms in working order: 12 were established in 1927, 9 in 1928, 9 in 1929 and 2 in 1930. They have distributed in all: 181,564 eggs for hatching — 16,527 chicks — 5,661 cockerels — 4,152 pullets.

The following are the proposals for encouragement of poultry breeding submitted by Prof. GHIGI and adopted by the "Consiglio":—

1. It is desirable to interest in poultry breeding both the landowners and tenants by inserting suitable provisions into share tenancy agreements. At the present time as the owner derives no advantage from the poultry yard of the tenant, he only allows the tenant to keep a strictly limited number of fowls, or enough for the tenant's own requirements.
2. The marking of imported eggs should be prescribed.
3. Distribution to tenants of breeding stock, in particular White Leghorn cocks, should be encouraged. (*Critica Zootechnica* 1931, No 4-5).

Rabbits.

RABBIT-BREEDING ARCHIVES AND MUSEUM AT LEIPZIG, GERMANY. — The recent foundation of these is due to the activities of the "Deutsche Reichszentrale für Pelztier- und Rauchwarenforschung" (National Central Union for investigation into the sphere of fur supply and fur bearing animals) with head-quarters in Leipzig.

MEASURES FOR ENCOURAGEMENT OF RABBIT-BREEDING IN ITALY, SUBMITTED TO THE "CONSIGLIO NAZIONALE ZOOTECNICO" AT ITS MEETING OF 8 MAY 1931. — The following measures were proposed by Prof. MAIOCCO (Alessandria) and adopted by the "Consiglio":—

1. Instruction of the rural population by means of lectures, pamphlets, etc.
2. Distribution at low prices or even free of breeding stock.

3. Establishment of State mating stations.
4. Grants to model farms selling breeding animals at reduced rates.
5. Competitions and Shows.
6. Determination of the most suitable breeds and their standardisation. (*Critica zootecnica* 1931, Nos. 4-5).

Fur Farming.

BREEDING OF FUR BEARING ANIMALS IN ITALY. — On this subject a report was presented to the "Consiglio nazionale zootecnico" by Prof. MAIOCCO (Alessandria), at the meeting of 8 May 1931. The following are the main points:—

At the present time there are bred in Italy the silver fox, the mink, the Chile beaver, the musk rat, while in addition Caracul sheep pure and cross bred are reared.

It appears from experiments made up to this time, that from the technical standpoint the breeding of the silver fox and the mink is quite practicable in Italy.

Chile beaver breeding has proved to be also advantageous from the economic standpoint. The Official Breeding Station at Alessandria has been able to sell these animals not only in Italy but in Switzerland.

Prof. MAIOCCO advises the careful watching of the fur farms in Italy so as to ascertain which animals prove remunerative and to use the experience thus acquired when it is a question of instituting new stations.

He advises instituting herdbooks for the different kinds of fur bearing animals.

He advises also the diffusion of the necessary technical information relating to the breeding of these animals by means of appropriate publications.

These proposals were approved by the "Consiglio nazionale zootecnico". (*Critica zootecnica* 1931, Nos. 4-5, p. 137).

E. M.

AGRICULTURAL INDUSTRIES

Processes for the extraction of nicotine.

As a result of the rapid extension of the use of nicotine as an insecticide, as well as the continued failure of growers to make adequate use of the selected varieties of tobacco having a minimum nicotine content, nicotine has acquired a value which makes it worth while cultivating certain varieties of *Nicotiana rustica* for the sake of their high content in nicotine (Soufé de Gabès, 12-13 % of nicotine, Brazil, etc.). This tobacco makes the best possible utilisation of clayey, heavy or sandy soils with a certain salinity, which are little or not at all suited for the cultivation of *Nicotiana Tabacum* or other crops. Any country therefore which aims not only at supplying its own nicotine requirements but also at exporting this valuable insecticide, should not rely on utilising only the waste products of its tobacco industry, even if the latter is well developed and if there are available wild species rich in nicotine which are used for their aroma in certain blends of smoking and snuff tobaccos.

Nicotine, as a free alkaloid or as a salt, may be extracted by various processes:—

(1) Extraction by organic solvents (benzine, petrols, trieline, etc.) as used for other alkaloids and for extracting fats from oleaginous seeds;

(2) Distillation in a current of steam;

(3) Extracting with an organic solvent the nicotine-containing juices resulting from fermentation of the raw material.

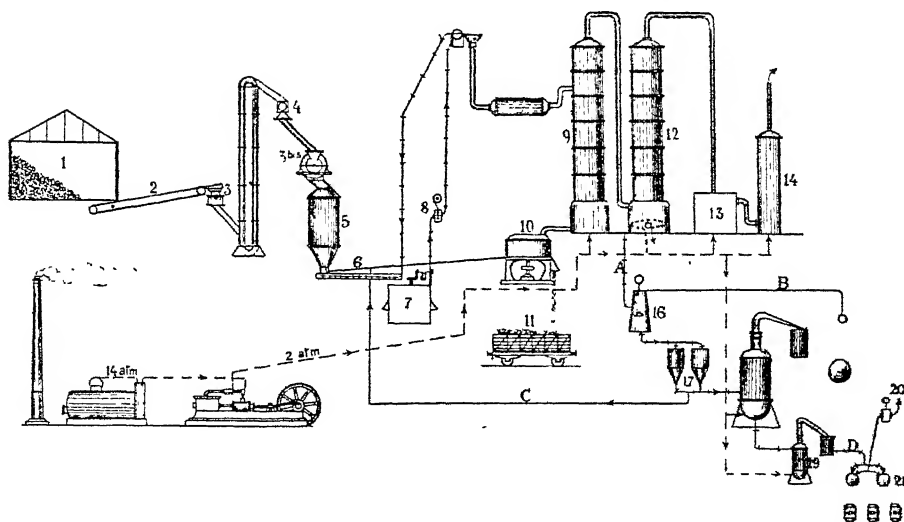
The first extraction by the first process gives a very impure nicotine, because the solvent extracts along with the nicotine about 4 times its quantity of fats, resins and waxes. These occur as impurities in the alkaloid and its salt in the

distillation of the solvent and in the treatment with acid to produce the sulphate, which makes purifying technically and economically difficult. As a rule in countries with cheap fuel the nicotine is distilled by passing a current of steam over the liquid after making it alkaline with caustic soda, and then the crude nicotine is collected in rectifying columns or else is fixed directly in 'scrubbers' containing pumice stone moistened with more or less dilute H_2SO_4 (U. S. A.). The tobacco monopolies of Italy, France, etc. and European factories prefer to deliver to farmers rich nicotine extracts (4-10 % of alkaloid) rather than the pure alkaloid salt, either because the product rich in lyophilous colloids more readily forms an emulsion with other insecticides (As, etc.) and adheres better, or because the presence of tabacine increases its efficacy.

The second process, that of removing the nicotine in a current of steam, gives good results provided that the tobacco used contains at least 2 % of nicotine. As has been stated above, this process is advisable only where power is cheap; it requires complicated plant, a delicate technique and skilled work.

The third process, exhausting nicotine juices with a solvent, employs simpler plant and a less complicated technique. When certain problems of its industrial application are solved it gives excellent results. To this class belongs the KNOTH process (used in Hamburg), the principle of which is as follows (see fig. 1):

FIG. 1. — Diagram of KNOTH nicotine extracting plant.



1 = Tobacco store. — 2 = Conveyor. — 3 = Chopping apparatus. — 3 b/s = Mill. — 4 = Electro-magnet. — 5 = Container. — 6 = Kneading apparatus. — 7 = Mixer. — 9 = Displacement column. — 10 = Hydro-extractor. — 11 = Extracted tobacco. — 12 = Rectifying column. — 13 = Ammonia absorber. — 14 = Lime tower. — 15 = Preliminary heating. — 16 = Agitator. — 17 = Separators. — 18 = Rectification of the benzine. — 19 = Distillation of the nicotine. — 20 = Vacuum pump. — 21 = Pure nicotine

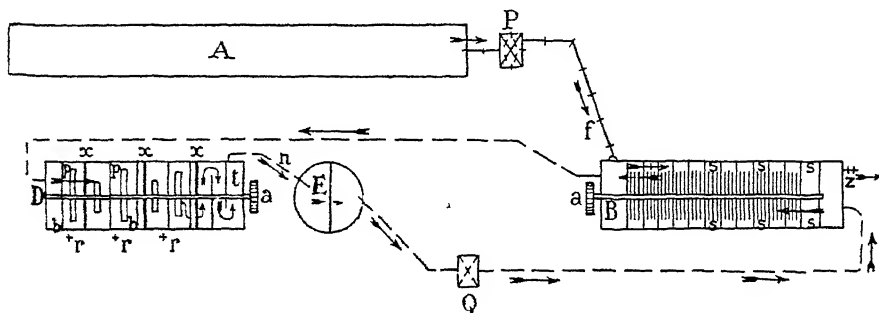
The tobacco after being chopped and pulverised and thoroughly kneaded in an alkaline solution enters the displacement tower, where the nicotine is set free and the residue falls into a hydro-extractor below, for the recovery of the alkaline solution. The nicotine-containing vapour passes into the rectifying column where

the crude nicotine is collected and then freed from ammonia by passing through the sulphuric acid apparatus and from acid vapours in the lime tower. The crude nicotine is then submitted to further purification processes:— is dissolved in benzine, washed with benzine, distilled from the solvent, and the nicotine remaining in the still is distilled *in vacuo* at 274°C . From 90 to 95 % of the alkaloid is thus recovered. In practice about 80 % of the nicotine is obtained from tobacco with a minimum content of 2 %.

The process which requires no heat seems preferable to the other two from an economic and practical standpoint. There are two industrial applications of the principle:— that of SCHLÖSING, employed by the French Monopoly (Cahors, Lot-et-Garonne), and that of BERNARDINI, adopted by the Italian State Monopoly, without taking into account the method recently proposed by Dr. G. PALMERI which is still in the experimental stage.

The indirect extraction of nicotine by solvents is effected in 4 phases:— (1) preparation of the nicotine juices obtained from the raw material; (2) purification or defecation of the nicotine juices to separate the other elements extracted by the

FIG. 2. — Diagram of Cahors (France) plant for production of sulphate of nicotine.



A = Reservoir for juice produced by lixiviation of tobacco in an alkaline medium (lime + caustic soda). — P = Juice pump. — f = pipe conveying juice into the exchanger. — Q = Petrol pump. — B = Exchanger; a = pulley working agitator spindle. — D = Churn; a = pulley working agitator spindle; x, x, x = closed partitions; r, r, r = outlet taps for the nicotine sulphate; n = tube carrying petrol into E. — E = Decanting reservoir.

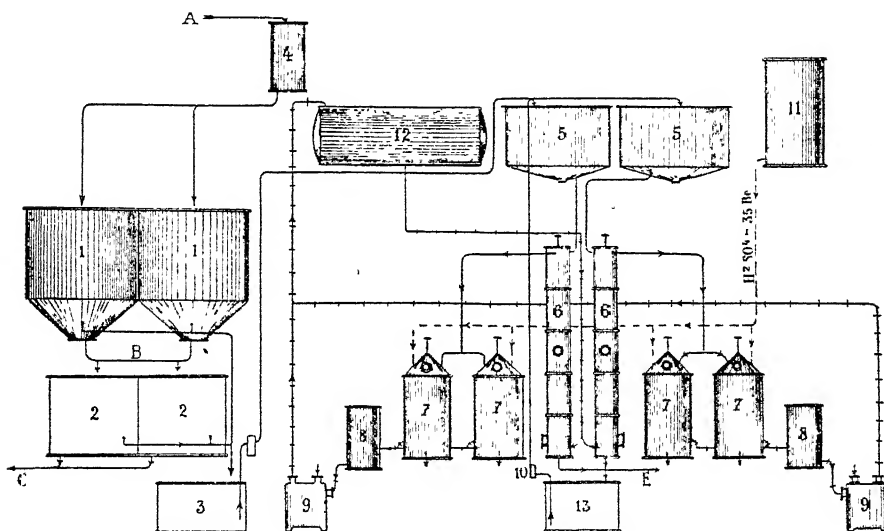
solvents; (3) fixation of the nicotine by an acid (preferably sulphuric acid); (4) recovery of the solvent for repeated use. The results of extraction on this third principle depend mainly on the system of exhausting the juice by the solvent, which is the most delicate phase of the operation, requiring an intimate mingling of the alkaline nicotine juice with the solvent so as to extract the utmost possible amount of the alkaloid without loss of solvent and, in consequence, of nicotine. This process requiring no heat is particularly suited for use with raw material poor in nicotine, such as the residues of *N. Tabacum*. The nicotine juice is obtained by washing the tobacco material in batteries of large wooden vats working 6 000 to 10 000 kg. of tobacco a day, and giving 600 to 800 litres of juice with 6 to 10 batteries of 9 vats each. The nicotine juice from the batteries is treated with lime and soda in large pans; after standing about 48 hours the clarified juice is pumped from the vats (with care not to disturb the lees) first into the apparatus for extraction by the solvent and then into that for fixation of the alkaloid. This phase of the operation which, as has been said above, is the most delicate and the most important, is effected by means of two patented inventions of SCHLÖSING, called the exchanger and the churn (fig. 2); the former is for extraction of the juice by a solvent (usually

low density petrol) and the second for treating the nicotine solution thus obtained with sulphuric acid.

The exchanger is a long cylinder divided into communicating compartments through which the juice and the solvent pass slowly in opposite directions: the petrol, being lighter than the juice, flows over the current of juice. An axis carrying usually light metal discs a few millimetres apart runs the length of the exchanger; by the slow rotation of this axis the discs are plunged into the juice below and the solvent above and so cause interpenetration of thin layers of the liquids without forming an emulsion. The solution then passes into the churn, which is an apparatus with communicating and closed compartments filled with H_2SO_4 , over which passes the solution and is continually agitated with the acid. The solvent freed from the alkaloid passes into a decanting chamber and then back into the exchanger.

The BERNARDINI system (fig. 3) which is used in Italy on various raw mate-

FIG. 3. — *Diagram of BERNARDINI nicotine extracting plant.*



1,1 = Defecation vats. — 2,2 = Receptacles collecting defecation residues. — 3 = Receptacle collecting the clarified juice and the water from washing the residues. — 4 = Tower for salting the juice. — 5,5 = Juice reservoirs. — 6 = Exchanger. — 7,7,7,7 = Agitators. — 8,8 = Decanting containers. — 9 = Juice pump. — 10 = Pump. — 11 = Sulphuric acid reservoir. — 12 = Petrol reservoir.

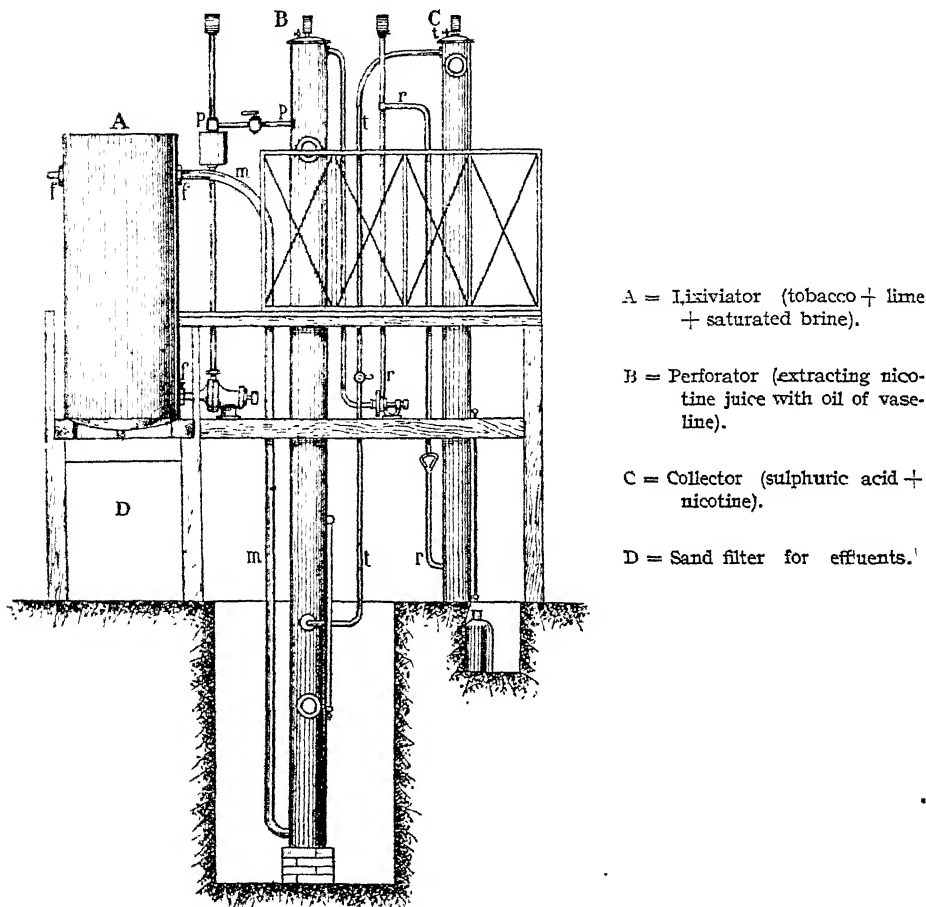
erials with low (1.5 %) and high nicotine content, is similar to the SCHLÖSING system but allows of a simpler plant and is easier to work.

The juice is extracted by the usual diffusion method. The apparatus can be used with various solvents, such as benzine, petrols, trieline, etc. The circulating liquid is less in volume and more concentrated. Defecation takes place in the well-studied vats as well in 24 hours as in 48. The exchanger tower of BERNARDINI has a special contrivance which without emulsifying it continually divides up the juice into fine drops and thus increases the surface of contact with the solvent and perfects the extraction. The nicotine-fixing apparatus also has advantages over the SCHLÖSING system: in place of the simple agitator of the churn type there are

2 double agitators, which ensure a more rapid and continuous action. The BERNARDINI plant requires considerably reduced power and fewer workers.

The PALMERI method (fig. 4), which is still under trial, gives excellent results

FIG. 4. — *Plant for extracting tobacco alkaloids by the PALMERI process.*



but requires on the whole a more complicated and costly plant than the BERNARDINI system.

A brief summary has been given of the chief methods in use for nicotine extraction. The BERNARDINI system would appear to be the best.

At this point it is worth mentioning the advantage which would be entailed in producing in nicotine the products in suspension (powders, desiccated juices, etc.), which give in many cases remarkable results. The addition of activators such as "Penetrol", the absorption of pure nicotine by earths or absorbing chars, the se-

paration of nicotine as picrate and tannate, and mixing it with arsenic and mercury, etc. salts and with methylnicotine and all the organic derivatives of the extraction or synthesis of pyridine or pyrrol, which all serve to complete and increase the insecticidal power of the nicotine, should be recommended and used in the special preparations of the State monopolies. Products could thus be made available to farmers which genuinely fulfil their requirements both from a technical and economic standpoint. They would also enormously reduce the work, which has to be undertaken by the chemical and phytopathological laboratories, of testing the numbers of insecticides daily put on the market, at high prices and often advertised as veritable panaceas, but causing disappointment and loss to farmers.

G. STAMPA.

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BOOK REVIEWS *

Meteorology.

Annali dell'Ufficio Presagi del Ministero dell'Aeronautica, Vol. III. Roma, Istituto Poligrafico dello Stato, 1930.

[The third volume of the Annals of the Weather Forecasting Bureau of the Italian Ministry of Aeronautics contains a report of the meteorological and aerological observations made at the Experiment Station of the Bureau at Vigna di Valle near the Lake of Bracciano (Latium) and gives an account of the aerial soundings carried out with pilot balloons, captive balloons and kites.

The Director of the Bureau, Prof. F. EREDIA, contributed an article on *The exploration of the upper atmosphere by means of sounding balloons* and gives the results obtained with the balloons at Vigna di Valle, where the upper atmosphere has also been explored by means of aeroplanes.

Prof. T. ALIPPI gives an account of *The abnormal atmospheric conditions of the 1928-1929 winter in Italy* and Prof. F. CASTRIOTA discusses at length *The problem of baric waves* in the light of recent research.

The volume is concluded with a study by Prof. F. EREDIA on *Aerological soundings at the Etna Observatory, Sicily*].

Annuario 1931 dell'Ufficio Presagi del Ministero dell'Aeronautica. Roma, Istituto Poligrafico dello Stato, 1930.

[The 1931 Yearbook, like that for the preceding year, contains data of practical value to meteorological and aeronautical observatories, but gives more space to meteorological radiograms received from stations in different parts of the world.

The Yearbook is edited by Prof. F. EREDIA and the following have collaborated in its preparation : — F. ALIPPI (Cloud observations in relation to their height and to the different sectors of the cyclone) — L. PALUMBO (Terrestrial magnetism) — G. MARTINELLI (Trajectories of cyclonic formations in Italy and over the neighbouring seas during 1930) — R. BILANCINI and F. CASTRIOTA (Interpretation of barometric depressions) — G. SCHNEIDER (Calculation of the duration of twilight and day length for the whole globe)].

Atlante meteorologico della Libia. Roma, Servizio cartografico del Ministero delle Colonie, 1930.

[This meteorological atlas of Libya drawn up by Dr. A. FANTOLI, Director of the Central Observatory of Tripoli, aims at supplying the public with a summary of the knowledge of the climate of the colony acquired mainly during the last ten years by the Meteorological Service. The synthetic summary is perhaps premature but may already be of use to those concerned in the agricultural development of Libya.

The work is divided into 3 parts. Part I describes the meteorological observation system of Libya and comments briefly on the maps of Part III. Part II contains a series of photographs of cloud types observed in Libya and of the alluvial deposits of recent years. Part III is the most interesting part of the volume and is made up of maps (mainly on a scale of 1 : 2,500,000) showing climatic zones, isotherms (annual, January and July), the annual thermic variation, distribution and frequency of rainfall and the predominant winds at different seasons].

PERRER J., *Atlas pluviométric de Catalunya*. Barcelona 1930, 523 p.

[This rainfall atlas of Catalonia obtained the prize in the 4th competition of the PARRIS Foundation and is elegantly got up and published by the Foundation. It gives a complete representation of the pluviometric conditions of northeast Spain with data from 306 stations.

The contents include an introduction by Prof. E. FONTSERÈ, and a general description of the maps, which show :— monthly, seasonal and annual rainfall, the annual rainfall at 25 stations, the part of each month in the annual total, percentage number of days with precipitations in each month. Bibliographical references are given and a summary in French].

* Under this heading short synopses are given of books sent for review.

Agricultural Engineering

DEUTSCHE BODENKULTUR A. G., *Beiträge zur Forderung der Landeskultur*, Heft 3, 107 p.

[The 3rd number of the Contributions to the Progress of Land Development, published by the 'Deutsche Bodenkultur', contains the following articles:— HERR, The progress and future of land development — WRIEDE, Progress in machinery and implements for use in land development — HESS, Land development in the mountain regions of Rhineland — LUTZ, Systemisation of the watercourses in Bavaria in view of land development — BUSSE, Maccarese, land development in Latium].

RE U. e VARETON E., *Carburanti, Carburazione*, Milano 1931, Ulrico Hoepli editore 516 p., 305 incisioni nel testo. Prezzo: 50 lire

[This book, which is dedicated to all dealing with internal combustion engines and carburants, gives a survey of all the important work of recent years on the subject. Each chapter is illustrated from the results of experiments carried out by the authors in the laboratories of the College of Industrial Chemistry at Bologna and in the engine testing rooms of the principal motor manufacturers in Italy and elsewhere.

The contents include chapters on the engine, its power and efficiency, carburisation, fuel and air filters, carburettors, detonation, benzine substitutes, carburisation with alcohol and alcohol mixtures, with benzol, naphthaline, tetraline and decaline, with petrol and naphtha (heavy oils), relation between carburisation and lubrication, carburisation with gas, etc., etc.].

Agricultural Industries.

GRATZ OTTO. *Die Technik der Schmelzkäse-Herstellung*. Kempten (Bayern) 1931, Volkswirtschaftlicher Verlag Kurz & Co, G. m. b. h. (*Süddeutsche Molkerei-Zeitung*), 171 p., 48, Fig., Schriftum.

[No work in English, French or German dealing with the manufacture of Schmelzkäse (melted cheese, or renovated or tinned cheese or tinned Gruyère) existed until this detailed study by Dr. Otto GRATZ, Director of the Royal Station for Milk Research at Magyaróvár, Hungary.

The cheese being of somewhat recent manufacture only the work is particularly valuable. It is copiously illustrated and contains a historical introduction and the following chapters:—

- (1) Advantages of melted cheese over other cheeses.
- (2) Nature of the raw cheese. Care required for its preservation.
- (3) Principal defects and pests of the raw cheese (bad coloration, cracking, swelling, moulds, defects in flavour, maggots and mites).
- (4) Technique of the manufacture of melted cheese — selection of raw cheeses, preliminary treatments, adding of fluxes, spices, colouring matter, etc., melting of the raw cheese, boxing and shaping, marking, sterilisation and storage.
- (5) Defects of melted cheese (defects of flavour and colour, swelling, moulds, mites).
- (6) Production costs.
- (7) Premises and plant of a melted cheese factory.
- (8) Content in fat and water of melted cheese.
- (9) Legislative measures concerning melted cheese.
- (10) Bibliography].

FORESTRY

Light and Forests: Recent Investigations.

One of the favourite problems for scientific research at the present time is the determination of the part played by light in the life of plants, independently of other factors, such as humidity or warmth. It is no easy task, since these latter factors, which are indispensable to all plant life, are always present, and the parts taken by moisture and warmth in plant physiology are so interwoven that they exercise an influence the one on the other. Hence in plant life there are effects really

due to causes other than light which are still even to-day attributed to the effect of light alone.

A thorough acquaintance with this problem is all the more important because, among the physical factors in plant physiology, it is precisely the effect of light which can be influenced by the silviculturist. It is a well known fact that the more the forest can utilise light the greater is its increment in volume. ROBERT MAYER has already defined the vegetable kingdom as "a reservoir in which the fugitive rays of the sun are fixed and skilfully kept in reserve till they are needed for use".

Recognising that forest trees of various kinds and ages may utilise differently the light received, the following classification of forest trees has for some time past been adopted: 1. light tolerating trees 2. shade tolerating trees and 3. part shade tolerating trees. Indication is also given of the methods which in the present position of the sciences can be followed by man so as to enable the trees to be reached by the degree of light most suitable to increment in forest yield. These classifications, as well as the methods formerly recommended are no more than the conclusions drawn from the final results obtained in the development of plants under the influence of light. As regards the very important physiological behaviour of the organs by means of which the benefit of the luminous rays is transmitted, there are only quite recent results of observations and investigations from which anything can be learnt.

Part played by the foliage. Leaves have not all the same vital function. Their development, even in identical soils and under the same climatic conditions, is quite different according to the place occupied by the branch on which they are borne in the crown of the tree. Light is the most important of the physical factors for the performance by the leaves of the function they perform in the life of the tree. The character of leaves developed in full light is entirely different from that of leaves grown in the shade. On the shady side of a branch the leaves are quite different from those on the side of the branch that is constantly exposed to the luminous rays. KLENITZ (Germany) has demonstrated recently the very essential differences between the physiological functions of the two types which may be called "light-leaves" (Lichtblätter) and "shade-leaves" (Schattenblätter). The most important result of the observations of this writer is that it makes known and at the same time explains, from the point of view of practical silviculture, the different function of the two types of leaves in plant life.

As is known, owing to their greater content in chlorophyll, the light-leaves assimilate more strongly than the shade-leaves. It is these light-leaves which nourish the plant organism and which produce the woody increment. But in order that they may accomplish this function, they must remain continually in full light. The activity of the shade-leaves in this respect is much weaker and may even descend below zero; their existence may even become directly unfavourable and harmful to the growth in volume, if they utilise for their own nourishment more of the food substances than they can manufacture. It is thus very important and necessary to remove at times the part of the tree that carries leaves of this type.

Science has not yet fixed the precise limit at which this harmful effect of the shade-leaves begins. Such a limit must however exist. It has been proved by a number of experiments that the yield in volume may be increased by the careful removal of the superfluous parts of the foliage, especially those which carry shade-leaves, before the leaves fall of themselves. There are trees which of themselves accomplish this detachment of useless foliage, but in the case of others it cannot be properly done except by human intervention. *Quercus pedunculata* and *Populus nigra* for example will drop, even in full summer, superfluous branches of the thickness of a finger.

KENITZ had found that these fallen branches did not contain starch and he explains this fact by the probability that before the fall the carbohydrates had passed from these branches into the stronger branches that were carrying the twigs. Such a spontaneous transmission of reserve material was not however always carried out and when twigs fall with food material still in them, cryptogamic diseases may develop on the scars left. Hence it is better to remove such branches or twigs at a time when their removal cannot disturb the vital competition of the different parts of the tree.

The same silviculturist had shown that the increment in volume can be increased in the main trunks, in a spruce stand, by cutting off the branches, even while still green, which are on the shady side of the trunks, taking care that the trees still remain in full stand. This is explained by the writer by the hypothesis that the higher branches bearing light leaves were by the operation freed from the business of nourishing the lower branches which carried shade leaves.

He has shown also that with the spruce such an operation gives the best result only if the superfluous branches are lopped about three years before they would dry off of themselves, *i. e.*, at the period after which they would only bear shade leaves.

It is not difficult to recognise the parts of the tree carrying shade leaves, the colour and shape of the leaves forming the indication. The two different types of leaves may be recognised in all kinds of forest trees, but more easily in some than in others.

The light-leaves of the beech are of medium size, but are thick and of stereophyllous construction, while the shade leaves are small, stunted and of feeble appearance; the half shade leaves are the largest but are very thin and somewhat flaccid. In the case of the conifers, the differences are very nearly of the same kind, but less noticeable as the needles are smaller in size.

It is possible to distinguish between the two types of leaves not only for the shade species, but also for the light species, although the variations are less striking in the latter case. KENITZ recognised for example the differences in the case of the Scots pine (*Pinus sylvestris*) as well as in the Red oak (*Quercus rubra*); in the case of the latter, it is the number and size of the leaf buds which show the largest differences. Between the two types of leaves there is no great diversity in size, but mainly in weight and colour. Investigations on this point have still to be made in regard to a number of kinds of forest trees.

It is thus possible to observe, between the different parts of a tree, a vital competition which in general results from the fact that the parts less useful or even harmful to the tree are naturally eliminated, owing to the greater strength of the parts which are useful to the growth. The same struggle, a similar competition, is to be observed in stands and in mass groupings of trees. The difference is merely that in the case of the leafy canopy of a mass stand, it is no longer a question only of the struggle between branches and leaves, but a struggle to the death between the independent trunks. And just as the artificial removal of the parts harmful to the tree secures advantages, so the careful intervention of the forester in the construction of mass groups is not only useful but also necessary. When in a forest the selection of the trees of the future is left to nature the desired result does not follow, as regards quality and especially as regards quantity of yield.

The clearing. — The theory of clearing was originally based on the observation that the crowded trees showed no or very little increment in volume; but up to lately, it was not recognised that these trees would not have increased in volume

even if they had been freed by the cutting for timber of the neighbouring dominating trunks.

Human intervention can be considered as justifiable only if it succeeds in increasing the area of assimilation. And this can be secured only by multiplying the number of light-leaves or in reducing the number of shade-leaves.

If such an intervention is attempted, it is essential to take into consideration that a shade-leaf, even if it comes into full light, can never be transformed into a light-leaf. The tree or the branch which only bears shade-leaves, if it passes suddenly without transition into full light, is fated to perish, and even if the passage from shade to light is slow and gradual, it will be only the buds of the following years which can produce light-leaves in place of shade-leaves.

According to KIENZT, the branches of spruce that carry only shade-leaves do not in any way contribute to the diameter of the tree, they may survive with difficulty for several years; but as soon as they receive sudden illumination, from the felling or lopping of a large neighbouring tree, they perish at once. The case is the same for the stands. As soon as a tree belonging to a group of spruce bearing only shade-leaves receives light, it dies at once. If however there are still some leaves which originally developed as light-leaves and only later passed into the shade or even if the leaves have grown in half shade there is some hope of a new formation of light leaves and a gradual restoration of the tree.

Herein lies the most important reason why the changes in the lighting conditions in stands (by clearing, cleaning or isolated felling) should always be carried out slowly and gradually. The general habit of the tree, the condition of the foliage, the internal structure of the leaves and their power of adaptation to changes, which is in general very slow, are all reasons for a slow and gradual transition.

It has lately been much discussed if clearing increases or diminishes the total increment in volume of a stand. It is beyond dispute that the volume is increased by clearings on the old methods which were applied only to the wind fallen timber, rotted or diseased trees. The more abundant light and air supplied to the stand by this operation favoured the decomposition of the crude humus, so that by the improvement of the soil, the growth of trees in volume was bound to increase. But in the case in which the main stand is also affected by the clearing, an increase in total volume can only be obtained if the surplus growth of the surviving trees is greater than the growth lost in consequence of the felling of the trunks. This will happen only if all the spaces are filled with light-leaves, as that is the only method by which the light can be utilised fully. It is true that after the felling of a large tree the desired end will not be quickly attained, but poor forest management at times calls for the removal of trunks, even if with sacrifice, for the forest yield benefits not only in quantity but also in quality by a clearing of this kind.

ROTH and SCHMOTZER (Hungary), on examining the results of clearing a stand of oak, on a large scale and with great rapidity, are of opinion that the most noticeable disadvantage of the rapid change in the lighting conditions is that the annual rings of the trunks become suddenly much wider (the quality of the timber being affected) and that the proportion of imperfect timber from these trunks also become very high in proportion to the heart wood. And as it is impossible to hasten the formation of heart wood the value of the trunks felled in these conditions does not increase in a measure similar to the total increase in volume.

It has been observed by the same writers that on the same stand such clearing was very shortly followed by a dying off at the crown of the trees, and it was their opinion that disease was due to the so-called "water-sprouts" the growth of which had been fostered by the sudden clearing operation. It seems probable that these

water-sprouts only developed where the branches of the trees left standing were bearing for the most part shade-leaves.

The more slow and gradual can be made the transition to illuminated conditions, the more advantageous for the forest, for its yield, as well as for the grasses, etc. of the forest soil and for the invisible sub-soil life (OPPERMANN, Denmark).

DENGLER (Germany) notes also that the annual rings of trees that are left standing after a rapid clearing become suddenly much further apart, but it is his opinion that this is not exclusively the result of the light ; other physical factors enter, in particular root competition.

Human intervention is in every case a necessity, but great care must be exercised. Too pronounced an intervention, even if carried out slowly and gradually, may have results quite contrary to those intended (DENGLER). The addition to the increment becomes uncertain. Reversion from too much light to moderate illumination is very difficult, and succeeds only to a limited degree, and very slowly and with the accompaniment of numerous losses.

If good stands are to be obtained, care must be taken to develop a leaf canopy which on its outer side is composed of light-leaves in the largest possible quantity. Small clearings should be filled by the crowns of trees forming underwood. If the main stand consists of light tolerating trees, an undergrowth of shade tolerating trees should be chosen, or of trees for the foliage of which the light let through by the leaf canopy of the main stand is sufficient. An undergrowth which carries shade and half shade-leaves and only a few light-leaves has the advantage that it prevents the trunks of the dominant stand from branching too much.

The *leaf-canopy* of a stand is never quite level ; it is usually unequal, consisting of acute angles and more or less sharp falls. The advantage of this is that the area devoted to the formation of light-leaves is thus greater, and that the majority of the leaves are living in a diffused light, which is more advantageous for the process of assimilation than direct light.

The formation of the crown of the trees and that of the leaf canopy of the stand are, taking into account the differences among kinds of trees, much influenced by the light, the quantity of which is often decisive in the struggle between terminal and lateral buds (RUBNER, Germany).

As regards the most convenient *time intervals* between successive clearings the old rule is universally accepted : make clearings as often as possible, but with moderation. Theoretically clearings should be renewed every year. But as this is not economically practicable, especially on the large forest ranges, six years for mixed oak and beech stands (DUCELLIER, France), and three years as a general rule (KRIE-NITZ) are proposed as the shortest intervals between the successive clearings in young timber.

As a general rule it is regarded as better to have the stand so close that even fungi cannot grow under the trees. This however is only satisfactory if the local conditions of soil and climate are favourable to the decomposition of litter, and if in consequence crude humus does not form. The danger of the formation of crude humus can also be prevented by an appropriate mixture of trees ; but if such a mixture cannot be provided, it is essential to remedy the situation by clearings not merely in the main stand but also in the undergrowth.

If the young seedlings of any forest tree of a mixed stand do not flourish as well under the shade of trees of their own kind as they do under that of another kind, the fact, according to the explanation given by FABRICIUS (Germany) does not in any way mean that the soil is impoverished for that particular tree. The reason must be sought in light conditions, and as the forester is able to modify these accord-

ing to requirements, the observed fact should not be regarded as showing that the tree should be replaced by another of a different kind, but merely that it is advisable to take the necessary measures, by means of suitable clearings, to remedy the position, while continuing to grow the most valuable kind of tree. If however any failure is observed in the growth of young thicket in the empty spaces, the cause of this is not want of light, but root competition.

RUBNER shows that if the capacity of species to tolerate shade is increased by fertile soils, this is merely the result of the fact that root competition is regularly less on the more fertile soils.

All trees tolerate shade more easily in youth than in more advanced age. This fact had been noted by RUBNER especially in connection with the oak and the ash.

Light requirements of forest trees also vary with the geographical position. The Baltic pine, for example, with its narrow crown, tolerated, according to RUBNER, more shade than the same tree in Southern Germany.

Intensity of lighting. — As regards the quality of the light required by plants, according to observations made by GRASOVSKY (United States of America), 170 candle power is essential to ensure equilibrium between plant assimilation and plant respiration; double, or 340 candle power is sufficient to permit of growth. With a greater intensification of light the increment is not larger in proportion.

According to investigations made by SHIRLEY HARDY (United States) young seedlings can survive for a period of from three to six months if they receive as much as one per cent. of full summer daylight. The specimens so treated however showed a tendency to height growth at the expense of diameter growth and to top growth at the expense of root growth. Leaf area also developed at the expense of leaf thickness.

According to the same writer, reproduction fellings should be so arranged that the light intensity during the day seldom falls below five per cent. of full daylight, and that for two hours or more it should be as high as 30 per cent.

Especially when young, trees endeavour to adapt their assimilatory organs to the quantity and intensity of light. BOYSEN JENSEN (Denmark), DENGLE and OPPERMAN show that the leaves and branches can make movements adapted to their light requirements.

Leaves are capable of modifying their construction if light conditions require.

Weeds. — It is a very remarkable fact that the plants which cover the soil in forests are also capable of adapting themselves to changes in illumination. Increase in the inner lighting of a dense stand increases not merely the development of the weeds, but also the number of kinds found (DENGLE). As soon as the dense stand begins to form, a large number of herbaceous plants, the light tolerating kinds, disappear (RUBNER). When the clearing is carried out more fully than is necessary, the weeds which compete with the young tree seedlings to the disadvantage of the latter, only disappear if the light becomes much weaker than it was at the time when these weeds first began to grow.

Production of future trunks. — Observations made by DUCELLIER (France) and MOLLER (Germany) relate to the methods of utilising light with a view to obtaining fine and healthy trunks in the next generation. MOLLER shows that the formation of an undergrowth of shade trees is in all cases indispensable (even if the clearing is already properly done) if future fine specimens are to be obtained. DUCELLIER emphasises, from the point of view of the production of future specimens the

necessity for making clearings gradually and slowly. He does not consider it possible to preserve trees after the definitive felling in a good state of growth, if they have not been for a long time prepared in advance. "Clearing is in fact continuous selection, and it is necessary to sacrifice many mediocre specimens so as to preserve the better ones in small numbers; here more than elsewhere, quality is worth more than quantity".

If over some decades the more valuable trees are always encouraged, and care taken that the whole of the leaf canopy is always provided with the largest possible quantity of light-leaves, there cannot fail to be increase in forest value.

G. LUNCZ.

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MONTHLY BULLETIN

OF

AGRICULTURAL SCIENCE AND PRACTICE

GENERAL AGRONOMY AND CROPS OF TEMPERATE REGIONS

Notes.

I. — GENERAL AGRONOMY.

Meteorology.

DAMAGE CAUSED BY A VIOLENT HURRICANE IN MINNESOTA (U. S. A.). — In the *Monthly Weather Review* (Washington, 1931, Vol. 59) No. 5, p. 198-199, 2 photos), M. J. MACCLURG describes the terrible ravages of a hurricane which passed over western Manitoba at the end of May 1931.

According to a prudent estimate, damage of all kinds amounted to at least 200,000 dollars: crops were destroyed to such an extent that they had to be re-sown — poultry flocks were annihilated with the few survivors (about 30) stripped of feathers — houses, farms, sheds and machines, agricultural implements, carried bodily away and scattered over the entire region — heavy iron and steel implements twisted so as to become unrecognisable — a farm house was hurled into the air and its walls scattered to the four points of the compass; the roof was carried over tree-tops reaching a height of 15 metres and fell into a field 200 metres distant.

No less impressive was the fate of a fast train travelling at 96 km. per hour: apart from the engine and the tender (together weighing 210 m. tons), which remained standing on the rails, the whole of the train (12 waggons of 53-81 m. tons) were derailed; 11 wagons were overturned and one remained upright because it was wedged between two carriages.

Two photographs annexed to the article show the aspect of the train after the accident.

PLUVIOMETRIC SYSTEM OF THE PRINCIPAL FRENCH COLONIES. — From the agricultural point of view, water is the meteorological factor which has the greatest influence and is more important in the warm countries than in the temperate zones, as, in the former, the lack of water may check growth in the same way as cold does in the latter.

For the growth of plants, the *monthly distribution of rains* is much more important than their *total yearly quantity*. For example, at Rabat (Morocco) and at Paris, annual precipitations are much the same and averages about 500 mm. but their effects on growth are very different: whereas in France the rains are distributed nearly uniformly over all periods of the year and favour the *summer growth of the plants*, in Morocco rainfall is nearly entirely limited to the 8 months October-May (500 mm.), then greatly reduced from June to September (15 mm.), the summer period during which growth remains stationary.

To ascertain the distribution of rainfall in France, the National Meteorological Office receives, each month, reports of observations made on a uniform basis by 1500 stations. In the *colonies*, on the contrary, these observations have not been well organised except in Indochina (700 pluviometric stations) and Madagascar (75 stations); with regard to the other possessions, the above office has, however, been able to establish from its archives, the main lines of the pluviometric system. The following table groups the most important data:—

Colonies	Dry season	Wet season	Annual precipitation
Senegal	November-end of May (except February, having very light rain)	End May-October (very abundant rain from July to September)	300-500 mm. on the coast for 30-40 days
Guinea	November-April	June-September (July-September torrential rains)	4,000-5,000 mm.
Ivory coast	Principal: January-March Secondary: August-September	April-July; October-December	About 2,000 mm.
Congo	Mid-May — mid-September	Mid-September — mid-May (on the coast, rain throughout the year)	1,500-2,000 mm.
Madagascar (E. coast . . . W. coast . . . Centre . . .)	No dry season May-September May-September	Rain all the year October-April October-April	Over 2,000 mm. Less than 1,000 mm. 1,000-1,500 mm.
Guadeloupe	—	May-November (not so wet as December-April)	1,500-2,000 mm. for 250-200 days
Guiana	August-November	December-July	About 3,000 mm. for 220 days (at Cayenne, up to 7,000 mm.)
New Caledonia	Minimum rainfall: August-November	Max. rain: March-May	1,300 mm. (E. coast) 2,500 mm. (W. coast)
Indo-China	November-April	May-October	1,500-2,000 mm.
<i>France:—</i>			
Mantua (Ain)	Min. rain: December-February	Max. rain: March-November	1,390 mm.
Perpignan (E. Pyrenees) .	Min. rain: July-August	Max. rain: September-June	554 mm.

For the whole of France, the annual average rainfall is about 850 mm. At low altitudes, the minimum is 500 mm. compared with a maximum of 1,500 mm. At high altitudes the annual precipitation may amount to over 2,000 mm.

In the colonies, the heaviest rainfall in 24 hours varies from 220 mm. (Guinea) and 604 mm. (Tonkin).

In France south of 45°, there has been registered 300 mm. (Gard) to 792 mm. (Ardèche) in 24 hours. In the northern regions, it is rare that more than 100 mm. of rain falls in 24 hours. (J. SANSON, in *La Vie agricole et rurale*, Paris 1931, No. 27, pp. 11-13).

T. B.

Soil Science.

THE SOILS OF SOME FRENCH COLONIES. — In the tropical regions, the knowledge of soils is particularly important to the planter in his choice of crops and the application of manures. The periodical *La Potasse* (Mulhouse 1931, No. 43, p. 103-105) gives some interesting information on this subject; a summary of which is given as follows:—

Lesser Antilles: In *Martinique*, the humus soil originates from the disintegration of volcanic surface material which has almost entirely covered the island. During the transformation of these rocks, their silica and potash have been gradually washed away by water which has left in their stead oxides of iron and aluminium resulting in yellow-reddish laterite soils; the latter harden in the sun whereas even light rainfall transforms them into a sticky mass having the appearance of clay. These soils are poor in chalk, potash and often in phosphate; they contain very variable quantities of nitrogen but in general, their humus, retained by the action of the hydrates of iron and aluminium, is of little value to the plants.

Some parts of the island do not present these characteristics, notably the Basse-

Pointe plains which have a soil formed of volcanic ashes, and the extreme south of the island (St. Anne), where limestone outcrops exist.

The volcanic soils of *Guadeloupe*, similar to those of Martinique, are very poor in lime and potash and their humus is retained by the action of the hydrates of sesquioxide. Phosphate is equally rare in some places. On the contrary, the Grande-terre, which is not of volcanic formation, has a sub-soil of a definite limestone type and a top soil containing sufficient lime to have a neutral reaction. In the substrata of clay-non-laterite soils, the sesquioxides are much less abundant than in the laterites.

Summarizing, most of the soils of Martinique and of Guadeloupe, naturally very poor in essential fertilizing elements, and also exhausted by heavy crops of sugar-cane, etc. and exploited incessantly for over 300 years, increasingly and imperatively need manuring

West Africa. — Most of the soils are completely exhausted of lime; they are laterite resulting from physical and chemical transformations similar to those mentioned above. Moreover, these soils are often very poor in all fertilising elements. If the lack of lime renders them suitable for cacao or coffee trees (Ivory Coast, Gold Coast) it prevents cotton growing which cannot thrive without the application of lime. These soils consequently need heavy applications of manures containing nitrogen, phosphorus and potash and for some crops, also the addition of lime.

Indo-China — The soils have hardly any point of resemblance with the laterites of West Africa apart from their red colour, as they possess very favourable physical properties, notably a good power of absorption. The red soils of Cochin-China, having an acid reaction, are, for this reason, particularly favourable to heveas, which have been planted there extensively. With appropriate fertilizers, they permit advantageous crops, thanks to their power of absorption which stores up the principal fertilising elements. Large quantities of fertilizers may therefore be applied without risk of loss.

Madagascar. — This island furnishes a very clear example of the rapid loss of the natural fertility of tropical soil due to reckless exploitation. The sub-soil rocks are very varied (crystalline schists more or less covered by recently erupted material over most of the island, sedimentary material in the West, etc.), but all have resulted in soils which have become covered with immense forests where the humus and principal fertilising elements have accumulated gradually, and the native has felled the forests to cultivate the land which he abandoned at the first sign of exhaustion. These abandoned soils, scorched by the sun, leached by torrential rains, became lateritic, eroded, or covered with bush and valueless vegetation. It is consequently no longer possible to grow profitable crops on them without extensive improvements and returning to them, in the form of fertiliser, the fertilising elements lost.

THE SOILS OF LITHUANIA. — These have been studied by Prof. S. MIKŁASZEWSKI (Warsaw), who has prepared a coloured soil chart, similar to his previous charts of Polish soils, and presented it to the 1st International Congress of Soil Science (Washington, 1927). He published a black and white diminutive of it in the periodical *Die Ernährung der Pflanze* (Berlin), No. 9, 1931.

In Lithuania, the predominant type of soil is the *leached forest soil* or "podsol" and, in general, the soils of this country are still more of this type than those of Poland. Most of them are also *heavier* than the Polish soils.

South of the river Niemen, between Kovno and the western frontier, there is a territory containing besides the "podsol", a black soil called "*ichernosiom of the Lithuanian marshes*", which is very fertile, but very wet and requires drainage.

Another special type of soil is the *podsol clay*, of which occasional outcrops exist. Along the Niemen and the E. and N. W. frontiers, there are also humus containing sands and dunes.

The *valley alluvions* are all *sandy*.

On both banks of the Niemen there are limited outcrops of *limestones, chalks and clays*.

Lastly, along the river Niemenėk (near the N. frontier) there is a *Devonian* basin.

Soil Fertilisation.

TREATMENT OF STREET REFUSE AT TURIN (ITALY). — Two processes were experimented with : (1) Combustion of the refuse in a slow furnace to utilise the ashes as fertiliser containing phosphorus and potash ; (2) Biological treatment of the sweepings in a zymothermic chamber to utilise them as organic nitrogenous fertiliser.

The plant for the incineration of the refuse comprises two sheds : (1) Under the first, the sweepings are heaped and protected against the rain — (2) Under the second there are two *furnaces* of different foreign manufacture (as they are not yet manufactured in Italy).

One of these furnaces is a parallelepiped measuring $2 \times 2.2 \times 6.3$ metres and is furnished with an electric blower of 5 H.P. to regulate input and air temperature.

The other furnace, of cubic form, has a 2.2 metres side and a smaller grating than the former ; it has also a secondary firebox serving to increase the draught when the blower has stopped.

The quantity of refuse burnt per hour in each of these furnaces varies greatly according to its condition and contents. However, the makers' guarantees of combustion capacity are well fulfilled. At the end of the day, the two furnaces are completely charged, the blowers are stopped and the chimney draught is so diminished that combustion may continued slowly during the night. The next morning all that is required is to turn on the blower and to re-charge the furnaces with refuse without having recourse to any other fuel.

Analysis of several samples of ashes has given the following results : P_2O_5 , 1.78-2.75 % — K_2O , 2.08-2.50 %. These ashes are bought as fertiliser by a local farmer.

The *fermentation chamber*, situated a short distance away from the furnaces, has a capacity of about 12 cub. metres and may contain 6 m. tons of refuse. It has a channel and tank for running off the liquids. Before heaping in the sweepings, they are sifted to remove pieces of glass, metal, bones etc. The heaps of 30 c. metres are inoculated with selected ferments taken from other chambers and watered with about 60 litres of clean water. Every four or five days, the temperature of the mass is taken : at first it rises, reaching 60° - $70^{\circ}C$, then it falls and remains stationary at about $30^{\circ}C$. This cycle lasts 30-40 days.

At the moment when the fermented mass is discharged from the chamber, it is brown in colour, of average consistence and has the odour of manure. It has not yet been analysed but is believed to contain an average of 11 % nitrogen. (TURIN, *Rassegna mensile del Comune*, Turin 1930, anno II, No. 7, pp. 62-68).

THE ACTIVE LIME OF BASIC SLAG AND THE PHOSPHATES CALLED "DISAGGREGATED" OR "BASIPHOSPHATES". — From the researches and experiments made by BRIOUX and JOUTS on this subject at the Lower Seine Agricultural Station (France), the following principal conclusions have been drawn.

Basic slag and Belgian *disaggregated phosphates* or *basiphosphates* are easily acted upon by carbonic acid which serves to promote their action in the soil.

The neutralising power of these basic fertilisers is much higher than their content in *free lime* (for a long time considered to be the only active agent in this respect). The lime of their silicates and silico-phosphates is liberated fairly rapidly in acid soils with the formation of $CaCO_3$ which neutralises the acidity of these soils ; it consequently adds its action to that of the free lime and the two together may be considered as *active lime* of which there was contained 30-34 % in the basic slag examined by the AA.

In the case of *basiphosphates*, to the action of the liberated lime there is added that of the sodium and potassium constituents of complex silicates.

Hydraulic lime contains basic silicates and aluminates which decompose very rapidly in damp soil, setting free in less than 24 hours, about 85 % of the total lime.

In the case of slag, "*basiphosphates*" and hydraulic lime, the neutralising power in the soil seems to bear a close relation to the solubility in carbonic acid. This solubility therefore permits these different products to be dosed with active lime.

Natural *mono-calcium silicate* (Wollastonite) is attacked much more slowly by carbonic acid.

The « *Raitiers basiques* » (basic slag) produced by furnaces are of only average solubility in carbonic acid, but appear to be more easily acted upon in damp soils where they have (during the experiments) liberated 2/3 of their lime in one month. Their use as

additional lime, especially for very acid, damp soils, may be considered in the neighbourhood of the furnaces if the other limes are deficient. (*Annales de la Science agronomique française et étrangère*, Paris 1930, No. 4, pp. 496-515).

T. B.

II. — CROPS OF TEMPERATE COUNTRIES.

Cereals.

WORLD'S GRAIN EXHIBITION AND CONFERENCE, REGINA (CANADA), 1932(1). — In July 1932 there will be held at Regina, the "World's Grain Exhibition and Conference", which may now be considered as promising to be one of the most important international agricultural events. The initiative has been taken by the Canadian Government, with the co-operation of the provincial governments, the town of Regina and most of the largest financial institutions and concerns of the Dominion.

The manifestation at Regina has a particularly interesting aspect as it will be at the same time an exhibition, a competition and a conference at which the agricultural world is invited to participate or assist and which will be organised in the following manner.

I. — *Competition-Exhibition*: This will comprise 5 or 6 kinds of money prizes to the value of over 200,000 dollars. The prize list includes all the chief crops, that is, the different varieties of wheat, oats, barley, maize, rice, millet, meadow grasses, pulses, textile plants, root plants, etc.

II. — *The Conference*: A committee has been created to prepare the Conference program, which should touch on all the main agricultural problems of practical and scientific interest; this program will consequently cover the following subjects:—

(a) Agriculture (study of soils, physical, chemical and bacteriological), problems and methods of cultivation, fertilisers, weeds, genetic diseases of plants, experimental methods, production of seed, etc.).

(b) Harmful and useful insects.

(c) Economic questions.

(d) Milling and baking.

(e) Agricultural machinery.

If considered desirable, a series of purely scientific conferences will be organised.

Finally, since the Exhibition at Regina touches all agricultural interests, it may be added that a livestock exhibition will constitute another of its most interesting features.

RAIN DAMAGED WHEAT USED FOR SEED. — The *Agricultural Gazette*, in May 1931 (Vol. XLII, Part 5), published an interesting article on this subject by J. T. PRIDHAM and A. T. CALLAGHAN, the principal points of which are the following: In the natural conditions of field cultivation, experiments have been made on the germination of wheat seeds called "shot" and "sprung" (the latter word signifies that the germ of the grain has not burst, whereas "shot" signifies that the grain has burst due to the swelling). The object of the experiments was also to show the effects of treatment with copper carbonate on such grains. The results have demonstrated that the property of germination of "sprung" seed was diminished; it was also slightly reduced by treatment with copper carbonate. The "shot" seed showed an important diminution of germination; this was still more marked after treatment with copper carbonate.

Commenting on these results, H. C. SLEENING, Chief Instructor of Agriculture, has ascertained that to obtain the equivalent of 1 bushel (60 lbs.) of healthy wheat seed per acre, it is necessary to sow 72 lbs. of "shot" seed; if the seed sown has been treated with copper carbonate one month previously 100 lbs. are necessary. It is seldom that the wheat is damaged to such a point that 100 % of the seed is "shot" as in the case mentioned above; but if a large percentage of the grain is "shot", it is preferable not to use it for seed if it is possible to obtain healthy grain. In the case of a quantity of grain having suffered average damage from the weather comprising a certain proportion of "sprung" and "shot" grains, and having been treated with copper carbonate, all

(1) At the time of going to press information has reached the Institute that the conference will be postponed till 1933.

that is required is to increase the quantity sown by 10 lbs. per acre. It is preferable to sow very thickly as it is always possible to thin the sowings afterwards while, on the contrary, it is very difficult to increase their density.

PRODUCTION OF AN ECONOMIC STRAIN OF WHITE BARBLESS BARLEY IN WISCONSIN (U. S. A.). — LEITH and R. G. SHANDS have published an interesting article on this subject in the May 1931 number of the *Journal of the American Society of Agronomy*. The following are its chief points :—

The Wisconsin experimental station in 1916 attempted to produce a pure line selection of white barbless barley from a cross between a black, smooth type and the Pedigree Oderbrucker variety. Some lines may be isolated as being as smooth as the smooth parent.

The best strain Pedigree 38, had a long basal internode. It is difficult to obtain a selection a long head with a short basal internode, as it seems that a long internode is linked with a long head.

The highest yielding strains reach maturity about 4 days later than the Oderbrucker parent; the heads are longer and the grains more plump.

Variations in stripe resistance from highly resistant lines to those more susceptible than the susceptible parent have been isolated.

In the field Pedigree 38 barley has given high yields; when grown at the experimental station, it gave, from 1928 to 1930, yields 17% higher than those of the Oderbrucker.

Leguminous Crops.

"HARD" SEED OF UNDERGROUND CLOVER. — On this subject, the *Journal of the Department of Agriculture of Victoria (Australia)*, in June 1931 published an article by G. E. HARRIS, the most interesting points of which are summarised below :—

If a number of these clover seeds are wrapped in a piece of damp paper and left for a few days, some become immune to the action of water, remain hard and do not germinate. As these "hard" seeds do not absorb moisture, it cannot be hoped that they will germinate at the desired moment when sown in a field; the grain is impermeable and as long as this state remains unchanged by natural or artificial means, germination cannot take place.

To observe the behaviour of these "hard" grains when sown, on 27 May 1929, 10 rows of 20 seeds of this clover were placed in a box of earth; at the end of each month, the number of seeds which had germinated were counted: every month with two exceptions cases of germination were observed, but their number varied greatly as is shown in the table given below.

Date	Cases of germination	
	Number	Percentage
1929 :		
29 June	57	28.5
1 July	1	0.5
1 August	1	0.5
1 September	3	1.5
1 October	5	2.5
1 November	5	2.5
1 December	5	2.5
1930 :		
29 January	0	—
26 February	54	27.0
30 March	2	1.0
1 April	0	—
1 May	4	2.0
Totals	187	68.5

The first strong germination (28.5 %) on 29 July followed the first good rain after the sowings: apparently this was the germination of the normal seeds and not of the "hard".

The remainder (71.5 %) consisting principally of "hard" seeds, germinated only a little each month until February, when, after a good rain, another section of 27 % sprouted; it may therefore be concluded that a good proportion of the "hard" seed germinates at the normal period of the year after that of sowing.

The "hard" seeds are not peculiar to underground clover, but are also to be found among many other plants, particularly pulses.

EFFECTS OF VARIATION IN DAY-LENGTH AND CLIPPING OF PLANTS ON NODULE DEVELOPMENT AND GROWTH OF SOY BEAN. — The *Botanical Gazette* of April 1931 published an article on this subject by Scott. V. EATON, the conclusions of which are as follows :—

Research has been carried out at the Hull Botanical Laboratory to discover the effects on the growth and development of soy bean nodules, of changes in certain factors affecting the total carbo-hydrates produced by the plant during the process of photosynthesis : these factors were the length of exposure to light and the amount of photo-synthetic tissue present, the latter being varied by clipping the plant to a greater or smaller extent.

(1) The amount of growth and nodule development was in indirect proportion to the length of day and the severity of the clipping.

(2) Nodule development was correlated with the percentage of carbohydrates and in particular to the acid-hydrolysable material of the plant.

(3) No correlation was found in the carbohydrate-nitrogen relationship of the plant and growth and nodule development, as regards the effects of this relationship on the development of the roots in proportion to the tops. In relation to the tops, the roots develop better during short than during long exposures.

(4) Growth and nodule development of the plant was in closer correlation with the amounts of chemical constituents expressed on an absolute basis than on a percentage basis.

(5) The degree of green colouring matter in the plant was proportional to the length of exposure to light and the phenomenon of etiolation was clearly demonstrated in the plants subjected to short exposures.

(6) Regarding the period of development of the shoots, there was found to be difference between the plants which had been subjected in the spring to variable day-length and those which had been clipped. The plants exposed to variable day-lengths in autumn were very different : The long-day plants had their tops better developed relative to the roots than the short-day plants. However there was no difference in the development of the nodules between the spring-grown plants and the autumn-grown plants, the development varying directly with the length of exposure.

(7) Various external factors which might account for the fact that the plants exposed to different day-lengths were similar in the spring but different in the autumn are day-length, intensity of light and quality of light.

(8) Whatever were the external factors responsible for the differences in the types of plants when day-length was varied in the autumn the carbohydrate-nitrogen relationship did not explain the differences.

A NEW COLOUR OF THE SHELL OF THE *Phaseolus vulgaris* — The *Journal of Heredity* of January 1931 (Vol. 22, No. 1) published an interesting note on this subject by T. M. CURRENCE, the principal points of which are the following.

The obtaining of new kinds of plants by synthetic hybridisation and selection has become an important branch of agricultural research ; a crossing made recently between two varieties of common kidney bean (*Phaseolus vulgaris*) shows its possibilities.

The Crystal white wax variety has a very pale green or even silver coloured shell ; this silvery colour differs from the normal green only by a single genetic factor ; by crossing with the yellow shelled kidney bean (wax), a new, white, shell colour is obtained in the F₁ generation ; thus this new type is derived from the combination of the yellow shell factor with the silver green factor ; it does not appear that the plant is homozygous for these two factors. The symbols used to denote the two factors are : SS for the silver colour and yy for the yellow colour. Naturally, the silver variety has the dominant allelomorph of y and the yellow variety, the dominant allelomorph of s. This having been once established the cross may be presented in the following manner :—

Parent plants : YYss (silvery) × yySS (yellow)

F₁ : YySs (normal green)

Theoretically, the phenotypes to be expected in F₂ should be :—

9 YS green — 3 Ys silvery — 3 yS yellow — 1 ys white.

The numbers actually obtained agree fairly well with this hypothesis :—

	Green	Yellow	Silver	White
Actual numbers	265	67	60	26
Numbers corresponding to the theoretical ratio 9:3:3:1	234	78	78	26
Difference	+ 31	— 11	— 18	0

Further experiments on the selection of the F₂ generation support this theory.

Considering that this white colour may be an altogether desirable factor in a commercial variety of edible shell, kidney bean experiments are being continued with the object of obtaining a kidney bean having these characteristics and possessing all the other desirable qualities of green kidney bean.

D. K.

TROPICAL AND SUBTROPICAL AGRICULTURE

Notes.

General.

THE PERIODICAL CHANGING OF FOLIAGE AND FLOWERING OF TREES IN SINGAPORE (INDO-CHINA). — An article by Mr. R. E. HOLFTUN in the *Garden's Bulletin* of June 3, 1931, draws the following conclusions :—

1. In the uniform climate of Singapore, trees of certain deciduous species change their leaves once a year usually when the season changes in February. Some change in August.

2. Four kinds of trees have been found which change their leaves twice a year, in February and August.

3. A large number of species of trees change their leaves at more or less regular intervals, though not every 6 or 12 months as those above-mentioned, and independently of climatic conditions. Variations also occur in different trees of the same species.

4. Some species change at very irregular periods (in particular *Hevea brasiliensis*).

5. The ageing of the leaves has been suggested as an explanation of the regularity in the changing of foliage of deciduous trees in comparatively uniform climates, but even the lesser climatic changes probably influence it to some extent, some species being more susceptible to such changes than others. The difference in the periods at which deciduous trees change their foliage is caused by the intermediary action of internal and external factors, which vary slightly according to the tree.

6. It is evident that the flowering of fruit trees, and of non-deciduous trees, depends on the dry seasons.

D. K.

Rice.

RICE MAKING AT TONKIN BY MEANS OF THE WHEELS OF A TRACTOR. — A new method of separating paddy from the straw has been demonstrated by M. VUVAN-AN, in the province of *Bac-Ninh*. It consists of running a tractor with angle irons attached to its usual farm wheels over a layer of unthreshed rice spread on a threshing floor. The tractor passes over the rice four consecutive times, and of course only the surface over which the wheel have passed is considered worked. The rice is thus shaken violently, the ear and the stalk are rubbed together, and after the four passages at least 3/4 of the grain is detached from the straw.

After having removed the straw which is sufficiently crushed the tractor passes over the remainder three more times. All the grain in the centre is by then well husked. There still remains a strip at the edges about 0.5-1 m. wide, containing a certain amount

of grain. This is thrown towards the centre and the tractor again goes over it three times.

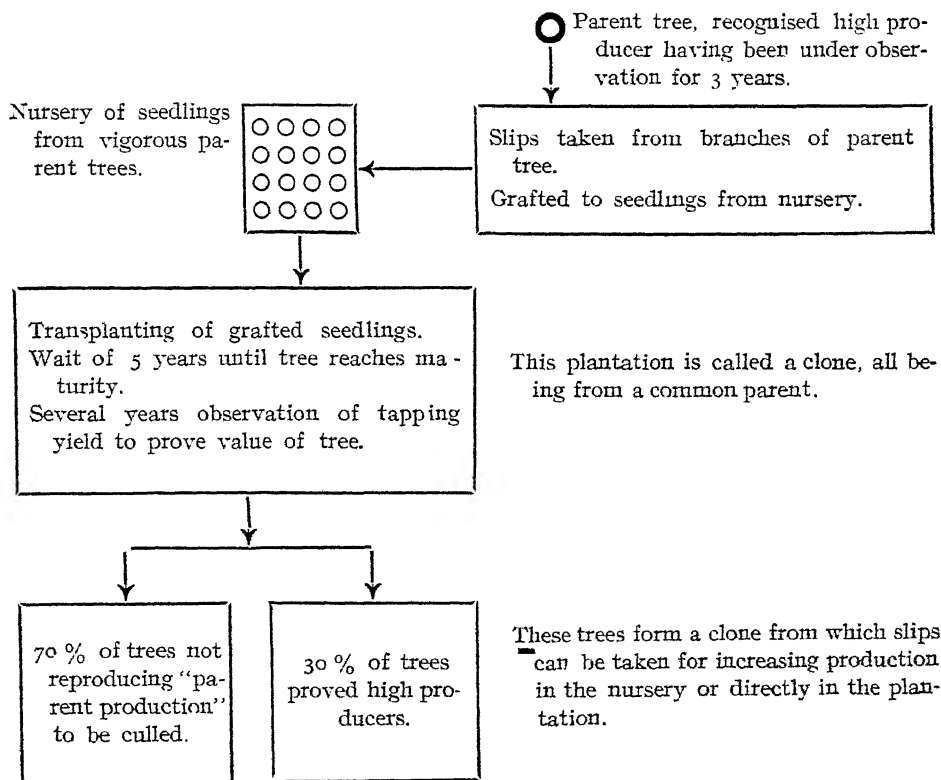
This method has the advantage of necessitating only half the labour used in threshing, making possible the stacking of the straw immediately after the husking, if this has been done in dry weather. Also, the amount of grain left in the straw is considerably less when husked by the tractor than when threshed. (R. RUMONT. *Les Produits Coloniaux et le Matériel Colonial*. Marseille, 1931).

Oil - yielding crops.

CULTIVATION OF THE OLIVE IN PALESTINE. — The plantations of olives in this country amount to an area of about 12,000 hectares. The average production per hectare is 18 quintals of fruit, which gives 3 quintals of oil.

Rubber.

MODERN METHODS OF HEVEA CULTIVATION. — In *Les Produits Coloniaux et le Matériel Colonial* (Marseille, 1931, No. 83, p. 49-51) M. GARNIER sets out the following plan for the multiplication of hevea trees by grafting:



Fruit Culture.

BUDDING OF MANGOES. — The mango is a fruit offering a great commercial future. At present the number of marketable varieties is very limited, and only the Bombay variety is known in England. Cultivation of this variety has therefore been

increased, and budding has been used with this end. Budding must always be done while the bark is easily detachable from the wood, so that slips may be taken leaving a smooth internal surface without any woody fibres.

The cut made on the stock is of the shape of an inverted triangle.

The usual precautions require to be taken after budding. Amongst other things it must be seen that the sun does not fall directly on to the new bud after it is in place. All buds which are still green 21 days after being placed will certainly develop.

The following are the varieties which are most successful :— Beef Mango, No. 11, Hairy, Black and Common. (M. S. GOODMAN and L. A. POWELL in the *Department of Science and Agriculture, Jamaica, Miscellaneous Circular* No. 1).

J. L.

AGRICULTURAL ENGINEERING

Storage and Artificial Drying.

The coming of the combine harvester-thrasher has completely transformed conditions on the world grain market. By its adoption countries which were formerly unproductive have been enabled to contribute to world supplies. Countries already grain-producing have replaced the old stationary thrasher by the combine or else are considering whether they must do so to continue to hold their own in competition with other countries, or whether they will be able to transform the old harvesting methods to rival the low production costs of the combine users.

The difficulties of the use of the combine in European countries are not due entirely to the American machines not being adapted to the European climate, but are also caused by the fact that the greater number of farmers have been accustomed to thrashing during the course of the winter and so have had to store only part of their crops in the form of grain. With the combine however the whole crop must be stored as grain immediately after harvest and the granaries are frequently found inadequate. The barns which formerly held the unthrashed corn are empty and the granaries are overflowing. Also if the weather is bad during the harvest the grain is moist and requires treatment to prevent it moulding in storage.

Setting aside the artificial drying plant in use in mills and the large grain stores, certain methods of treating moist grain before storage on the farm will be discussed.

A distinction is drawn between artificial and natural drying, that is to say, between systems which do and do not make use of heat. In natural drying the moist grain must be brought into frequent and close contact with dry air. The best known method is simply turning by hand the heaps of grain, but that requires costly labour.

Various methods have been tried for increasing the natural air current so as to avoid turning. Aerating turrets which allow a current of air to pass from the bottom of the granary up through the grain heaped above them have given good results when they have been placed closely enough together.

The grain can with these turrets be stacked twice as high as without them, but even so the grain must be turned every 8 or 10 days. There is however considerable saving of labour (*Technik in der Landwirtschaft*, Heft 2, Berlin 1931).

In America putting gratings of metal tubing in the wooden bin to allow air to penetrate into the grain has been tried. (*Agricultural Engineering*, St. Joseph, Feb. 1929). This method gives good results if the grain is nearly dry when stored. The same effect was obtained with granaries divided by slat shutters into compartments with aerating chimneys.

Results have on the other hand not been satisfactory with simple planks placed across the heaps at a certain distance apart to allow air currents.

Where granaries are built in several storeys good aeration can be obtained by allowing the grain to run down from one floor to the next ; if it is then raised again by a cup elevator or suction tube and passed through a fan winnower, turning becomes totally unnecessary.

But even with this system the grain must not be heaped too high on the different floors and one floor must always be kept empty to allow of the shifting of the grain. On account of these drawbacks further attempts are continually being made to construct silos for the farm such as are in use at the large mills or grain stores. Experiments in America have shown that silos in concrete or steel can be recommended only if the grain is repeatedly transferred from one silo to another and thus aerated (*Agricultural Engineering*, July 1930).

A German farmer has built a silo with Venetian shutter walls. The grain was poured into the silo from an elevator at a great height, and during the autumn the grain was several times moved and thoroughly aerated in a winnowing machine.

Aeration is naturally useless unless the air passing through the grain is capable of absorbing moisture. It is not easy to estimate the vapour tension of the atmosphere and determine whether in the given meteorological conditions the air will remove or impart moisture. To assist in this estimation Dr. SEIDEL has published (*Allgemeine deutsche Mühlenzeitung*, Berlin-Charlottenburg) a simple table giving the temperatures within the grain and of the outside air, both of which are readily measurable ; at the point of intersection of the two temperatures there is shown a line if aeration is possible, or a number if aeration is practicable only when the relative humidity of the atmosphere is below this figure ; in other cases aeration will introduce instead of eliminating moisture. This simple table should always be consulted when grain is to be dried by any aeration method.

In Sweden trials have been made of storing grain in high silos and shifting it by suction. At the top of the silo the grain falls over plates which spread it into a thin layer before it drops back into the silo (*Deutsche landwirtschaftliche Presse* 44, Berlin, 1928). Another Swedish grain drier is crossed by planks in the form of a roof under which small air channels remain when the grain is stored. These channels are some in communication with one some with the other outside wall of the rectangular silo. The air which is compressed by being driven between the double walls of the silo seeks an exit into the grain by way of the channels and escapes again by the channels communicating with the opposite wall (EDHOLM system).

The RANK aerating silos are constructed on a similar system (*Technik in der Landwirtschaft*, February 1931). Compressed air passes through the grain by a vertical chimney and out again between the double walls of the silo. The openings of the aerating chimney can be opened and shut in turn so as to aerate the whole mass of grain. In these systems also the important point is to aerate when the difference in humidity of the grain and air is adequate to produce a genuine drying.

The artificial methods of drying which are customary in mills, breweries and large grain stores are seldom found on the farm. The plant is costly and is therefore remunerative only where large quantities of grain are to be dried during a considerable part of the year. Here and there old malt kilns are still found on farms and attempts are being made to adapt them for drying grain thrashed on the field or by the combine. But the use of the kilns requires considerable labour and there are difficulties in regulating the temperature, so that it sometimes happens that the grain is over-heated and rendered useless for seed.

A drying plant consisting of an iron bin in which the grain is dried by steam-treated air, a winnower for cooling the grain and two large steel silos containing together over 3000 quintals, has not given very satisfactory results in trials. The grain became so hot that the weak current of air from the winnower was not sufficient to cool it; it arrived still warm in the silos and so became overheated during storage and was spoilt. This plant was also expensive to run. (*Technik in der Landwirtschaft*, Berlin, February 1931).

A moveable grain drier has been tried in Sweden as an attachment to the combine harvester. The grain runs slowly along a narrow channel in which it is first dried by hot air and then cooled by cold air before being bagged. Reports on the practical working of this drier are favourable, but unfortunately there are no data on the economic side of the question.

In addition to drying by artificial heat in northern countries drying by artificial cold is of considerable importance. The cooled air loses part of its moisture by condensation and thus takes up moisture from the grain. Refrigerated grain stored in insulated silos can be kept for a considerable length of time without requiring to be moved. Grain depôts are already found in conjunction with cold stores for meat.

For the farmer this method is of less importance because the refrigerated grain readily absorbs moisture when it is taken from the insulated silo into warmer air. For transport of cooled grain refrigerator cars or boats would be required.

Thus it seems that there is not yet any inexpensive grain drier that can be recommended for economical use under any conditions on the farm. The choice must be made amongst those described according to the conditions of the particular farm.

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Notes.

THE AMERICAN SOCIETY OF AGRICULTURAL ENGINEERS. — This Society which has recently been formed has 5 technical and 5 geographical subdivisions. The committee has representatives from important foreign organisations. The March number of *Agricultural Engineering* gives a list of the engineers responsible for the Society's various lines of activity, but unfortunately does not show clearly the relationship between the various divisions.

MANUFACTURE AND SALE OF FARM EQUIPMENT IN THE UNITED STATES. — The value of farm machinery produced in 1930 was 16.68 % below that of 1929, *i. e.*, 505,816,296 dollars as compared with 607,063,605 dollars. In 1930 the value of the machines sold in the United States was 16.92 % below that of 1929, and the value of the machines exported was 12.93 % lower than in 1929. The following table shows the particulars for the three years 1930, 1929 and 1928. (See table at page 385).

AGRICULTURAL MACHINERY AT THE GERMAN AGRICULTURAL SOCIETY'S SHOW AT HANOVER, 1931. — In previous years manufacturers of farm machinery have been obliged to present something new for the trials at the D. L. G. Show. This year however at the Hanover show they devoted themselves to improving the material and construction of the machines. The trials were mainly of devices for harvesting lodged grain, potato harvesting machines, small scale plant for seed preparation and machines for fastening down cans of preserved foodstuffs.

The developments were characterised by the increased use of steel to replace wood in the machines and by a further extension of the use of the Diesel engine.

In the plough section an increase in the use of the reversible plough was noticeable.

Value (in dollars) of farm equipment manufactured in the United States and sold in 1930, 1929 and 1928.

Machines	Years	Machines manufactured in the United States	Machines sold	
			in the country	abroad
Ploughs and listers	1930	87 830 075	93 483 065	8 693 521
	1929	42 315 129	30 450 213	8 920 618
	1928	32 158 754	26 436 118	6 696 737
Harrows, rollers, pulversers, etc	1930	13 813 730	11 537 504	1 505 987
	1929	16 813 081	13 399 536	2 445 065
	1928	14 637 293	12 869 884	2 026 430
Planting and fertilizing machinery	1930	26 087 161	21 030 871	2 303 925
	1929	31 145 092	24 811 493	3 659 795
	1928	26 504 967	24 386 730	2 236 077
Cultivators and weeders	1930	20 606 889	17 637 613	1 167 151
	1929	22 856 855	20 536 408	1 126 102
	1928	15 864 256	16 534 167	769 288
Harvesting machinery	1930	62 145 315	42 030 211	13 772 325
	1929	87 712 968	53 655 787	20 530 151
	1928	67 291 217	48 641 568	16 747 852
Haying machinery	1930	17 106 456	14 039 804	1 477 270
	1929	18 711 607	17 310 924	1 786 786
	1928	16 057 706	13 760 105	1 499 086
Machines for preparing crops for market use	1930	20 638 067	18 734 211	3 161 503
	1929	30 103 354	21 824 844	3 160 567
	1928	38 465 608	25 148 776	5 987 439
Tractors	1930	205 657 133	133 054 559	57 481 157
	1929	227 632 527	155 406 163	59 314 691
	1928	191 978 126	122 281 032	47 872 608
Horse-drawn vehicles	1930	4 947 513	4 754 055	88 189
	1929	8 813 307	8 194 073	580 357
	1928	9 974 420	9 405 824	538 672
Barn and barnyard equipment	1930	8 449 833	8 369 310	21 278
	1929	10 269 150	10 019 855	37 002
	1928	9 096 328	8 950 025	41 390
Miscellaneous	1930	88 474 094	81 326 538	8 593 918
	1929	110 640 505	99 911 768	11 229 121
	1928	107 176 423	94 457 804	10 692 891
Totals	1930	505 816 296	380 936 741	96 266 230
	1929	607 063 605	458 521 064	112 879 455
	1928	524 255 416	402 472 036	95 158 470

From *Farm Implement News*, Chicago 1931, No. 23, p. 23-25.

Important progress can be reported in farm electric plant, for example, warranted moisture-proof, electric installations for stables, dynamos with short-circuited armature, etc.

A new type of straw baler has been developed by LANZ which is very short and compact and even the small straw falls into the press without any special mechanism. (*Deutsche Landwirtschaftliche Presse*, Nr. 22 — *Die Technik in der Landwirtschaft* 1931, Nr. 4. — *Sonderverzeichnis der Prüfungsgeräte der 57. Wanderausstellung der Deutschen Landwirtschafts-Gesellschaft*, Hannover 1931, 154 p. — *Mitteilungen des Reichsverbandes des Landmaschinenhandels*, Berlin 1931, Nr. 11).

NEW HARVESTING SYSTEM. — On the farm of the Prague Agricultural College (Czechoslovakia) a new method has been invented and tested which can be employed wherever a reaper-binder is in use. The binder is provided with a cutting device

which reaps the heads with the upper part of the straw; these fall into an accompanying cart. The straw is left in bundles on the field to dry. Along with the binder is drawn a stubble-breaker which can be fitted with a seed drill for a green manure crop.

The straw being separated from the heads makes it possible to harvest with the binder a crop such as mixed barley and clover which could not otherwise be harvested in this way for fear of the clover imparting moisture to the grain.

The length of straw to be cut with the heads is readily adjusted according to requirements.

This method allows of considerable saving of labour and may still be further perfected. It has the drawback however that it cannot be used with a lodged or tangled crop. (W. ROSAM, Ein neues Getreide-Ernteverfahren, *Deutsche Landwirtschaftliche Presse*, Berlin 1931, Nr. 1).

H. J. H.

ANIMAL HUSBANDRY

Tendencies in the evolution of the sheep breeding industry in Hungary and new research in this field.

Originally, the population living in the present territory of Hungary undoubtedly reared the Tzigai sheep, related to the Balkan sheep, or sheep of the Ratzka type originating in the East. These first sheep populations were, in the XVIIth century, crossed with the sheep of Franconia and Wurtemberg, introduced into Hungary by the original colonisers of South Germany; this breeding was partly continued on pure bred lines but the animals were also often used for crossing. In the XVIIth and XVIIIth centuries, some large proprietors imported sheep from Padua and Bergamo (Italy), in order to increase, by crossing, the fineness of the wool and the milk capacity of the native sheep.

Hungarian sheep breeding experienced a fundamental transformation in the XIXth Century. Rams coming at first from the Merino flocks of Spain, then the Electoral of Saxony and the Rambouillets of France, gave a merino type to nearly all the sheep flocks. Lastly, towards the end of the century, when the market prices of fine wool fell too low, a considerable influence, especially on the raising of sheep in southern Transdanubia, was exercised by the early French Merinos and by the German meat Merinos used to obtain an increased size of body.

The number of sheep in Hungary is at present about 1.5 million head, of which 96-97 % are of the Merino type. Hungary may well be proud of still possessing, today, 5 or 6 large flocks of Merinos (2-3 % of the total number of Merinos) composed of direct descendants of the Electoral-Negretti type, which furnish a fine carding wool (AAAA) stated by the experts hardly to exist elsewhere today. Moreover, 5-6 % of the Merino populations belong to the trans-Danubian flocks, which are well known in the European textile industry for their production of fine wool AAAA/AAA and AAA. The majority of the Merinos, that is, the flocks living on the plains, give a carding wool graded AA and the combing wools AA and AA/A. The wools are obtained, not only from the Hungarian combing wool Merinos but also from the Hungarian meat Merinos, which are the result of crossings with the early Merinos.

Besides the strains mentioned above, the total number of Hungarian sheep also includes some thousands of Ratzka, nearly as many Tzigai, and some flocks of sheep from Eastern Friesland, the Hampshire downs and Karakuls.

The most important Hungarian sheep strains and their evolution are described in the following summary.

CARDING WOOL MERINOS. — The types of Hungarian carding wool sheep began to develop between 1830 and 1850. This involved the sacrifice of the fineness of wool of the "Electoral" strain, which, however, was no longer sufficiently appreciated by the market, and the "Negretti" blood was added to increase the weight of the fleece and the resistive capacity of the organism.

These types originate, therefore, from the material "Electoral" and "Negretti" and have been created by means of rigorous selection of individuals complying with the general breeding requirements and also from the point of view of fine wool sheep, by crossing with the Rambouillet sheep.

The skin is not pigmented. Black lambs are occasionally born but are rigorously excluded from breeding. The rams have spiral horns, which are absent in the ewes. In the better strains, the body is well proportioned, the trunk of average length and low, the legs are column-formed and the bones are not too fine. The animals are not uniformly covered with wool; in some flocks, the ewes have no wool on their faces or legs; in others, on the contrary, these parts of the body are completely covered. The skin is smooth; at the most only two or three folds are to be found on the neck. Only the flocks still possessing much of the "Negretti" blood have also heavy folds on the body and thighs. The weight of the ewes averages 25-40 kgs.; that of the rams, 50-60 kgs. The height at the withers is 60-65 cm. in the former and 65-70 cm. in the latter.

The threads of wool have a diameter of 14-18 microns. The length of the locks of wool is 3-5 cm. The weight of fleece is 2.5-3.5 kg. or as much as 4 kg. in the ewes and 4-6 kg. in the rams.

The grease varies in different flocks and also in the single animals; side by side with those which furnish an easily soluble grease, there are others which have a resinous grease difficult to dissolve. Yield varies from 20 to 25 %. The wool is generally divided into the grades of fineness AAAA—AAAA/AAA—AAA.

The sheep of these types are exclusively wool sheep. Owing to their small weight and late development, their meat yield is of little importance. The milk serves only for feeding the lambs.

This type of sheep has almost completely disappeared in the western lands of Hungary. But, as, for the manufacture of very fine articles, the textile industry will always need the grade AAA/AAA, such as is today furnished almost exclusively by this kind of sheep, their wool is still priced relatively high due to reduced supply. During recent years, the disastrous fall in wool prices has shown its effects particularly on the AA and A wools, whereas prices of the wools mentioned above have dropped relatively little. It is to this fact that must be attributed the considerable extension in recent years of the rearing of carding wool Merinos in the western part of the country.

COMBING WOOL MERINOS. — In the first half of the last century, when the production of first class carding wools became less profitable, numerous Rambouillet rams were introduced into Hungary destined, on the one hand, to increase the size of body and weight of fleece of the carding wool flocks, and, on the other hand, to transform into a uniform type of Merinos, the Ratzka and "Schweben" sheep bred on the great Hungarian plain as well as their crossbreds. This result has been obtained thanks to work over several decades and it is in this way that there have

been created the different larger or smaller types of Merino furnishing more or less fine combing wool.

At first, the rams all had horns but now there are to be found, even among animals of this type, hornless rams. The ewes have arched heads but no horns. The rams may have one or two folds on the neck as secondary sexual characteristics, but the ewes can only have a folded dewlap.

The bone structure is strong and the legs are generally well shaped. The animals are completely covered with wool. The weight of the ewes varies from 35 to 53 kgs. Among the elite animals, in exceptional cases, it reaches as much as 60-70 kg. while the rams, weighing ordinarily 70-90 kgs., in exceptional cases reach 110-120 kgs. The height at withers is 65-75 cm. for ewes and 70-80 cm. for rams.

The diameter of the wool fibre is 18-26 microns. The fleece locks of the ewes are 6-8 cm. long and the fleece weighs 4-7 kgs.; that of the rams weighs 7-10 kgs. and in some remarkable flocks, 12 kgs. The grease is yellowish in colour; the wool is fairly easy to scour. Its yield varies from 25 to 35 %. It is sometimes graded AA, but generally A/AA.

The wool of these sheep is well known and appreciated on the world market owing to its resistance, extensibility, flexibility, its bluish-white colour and its lustre. But the uniformity of the flocks and even of the fleeces, still leaves something to be desired so far as small producers are concerned.

After the weaning of sheep aged 3 months the ewes are again milked for 1-5 months, yielding 10-40 litres per animal. Generally, milk production is of only secondary interest, but there are also some flocks for which it is considered to be as important as wool production.

Although the earliness of these sheep is only average and they do not utilise their feed so well as the meat Merinos, yet they can be used for meat production owing to their size.

They are hardy sheep requiring little attention and due to these qualities play an important part in sheep rearing on the plains, where the animals need to adapt themselves to extreme climatic conditions, are given nothing but straw in the winter and, in summer, are often obliged to remain on poor, dried up pastures on sandy or alkaline soils ("szik").

The combing wool Merinos are at present the most important types in Hungarian sheep rearing and it is estimated that, especially on the plains, thanks to the qualities mentioned above, they constitute the sole sound basis of the sheep rearing industry. Several large rearers have already proved that it is possible to select relatively easily from the Hungarian combing wool sheep, flocks furnishing a fine wool (diameter, 18-25 microns (AA/A) — length of lock 6-7 cm. — weight of fleece, 5 kgs. — yield, about 40 %) and at the same time considerable quantities of milk, without detrimental effects on resistance, extensibility and flexibility of the wool or on the resistance of the organism or the hardiness of the animals.

The excellent qualities of these sheep have also been recognised by the breeders of Greece and Turkey who, for some years past, have exported large numbers for breeding purposes.

THE HUNGARIAN MEAT MERINOS. — About 20 or 30 years ago, the idea was also conceived that under better economic conditions, there might be introduced into Hungary the types of earlier Merino, utilising their feed better, having a larger body, of better form and a healthy high-yielding combing wool, even if some sacrifice were to be entailed in the requirement of richer feeding and better maintenance.

It is in this way that the rearing of early Merinos was first begun on the farms of Transdanubia, where economic conditions were better, but later extended to the great plain. From the fundamental material of native combing wool sheep (Rambouillet type) there were selected animals of better form, having a deep chest and pelvis, well developed legs, skin without folds, soft and elastic and longer wool locks containing less grease, and these ewes were paired with the French or German meat Merino rams or with rams from native breeds already constituted according to the above principles.

But the Hungarian meat Merino has not become a type identical with the German or French meat Merino. Hungarian breeders have had to take into account the natural and economic conditions of the country; sheep rearing in Hungary is especially based on pasturage and the utilisation of hay and straw, but one may not always count upon such good grazing conditions or such good hay crops as in the western countries having larger atmospheric precipitation. Moreover, in Hungary, the consumption of mutton is so insignificant that it does not pay to use a large quantity of concentrated feeding stuffs, which is a fundamental requirement in specialised production for meat. Continuous grazing also is only possible with a mobile, resistant and hardy type.

This explains why, among the Hungarian meat Merino flocks, the weight of the ewe is only 50-60 kgs. and also why the rearers of elite flocks have not attempted to surpass this figure.

It was necessary to restrict the objects of breeding in such a way that the wool did not lose too much in quality, but retained an average fibre thickness of 22-26 microns (grade A). It was also important to ensure that the thickness and surface of the fleece and the length of the locks did not suffer as a result of the new breeding tendencies, in order that Hungarian breeders might profit by the favourable climatic conditions to produce fine wool. It is, in fact, only by a larger production of fine wool that the stock farmer may compensate for the difference in profit of which, in the countries having better market conditions for mutton, the rearers of true early Merinos, are assured, even if they neglect wool production. Although this may seem strange, it is nevertheless certain that, among the Hungarian meat Merinos, wool production does not play a secondary part, but is given the same attention as production for meat. Among the Hungarian flocks where these principles are applied, on shearing, 4-7 kgs. of wool are obtained from the ewes and 8-9 kgs. from the rams, with a yield of 36-40 %.

Among these flocks, the weight at birth and the earliness of the lambs are higher than among the combing wool Merinos.

The animals are ready for covering at 1 ½ years old and have a good fertility; as a rule, 130-140 lambs may be counted upon for 100 ewes.

THE HUNGARIAN TZIGAIA SHEEP. — As has already been mentioned, there are still reared in Hungary several thousand head of Tzigaia sheep, especially in the northern highland region and also in the northern half of the region of the Danube and Theiss.

The Tzigaia sheep bred in Hungary have black heads and feet; the colour of the remainder of the body is a blackish-brown, yellowish brown, or reddish brown. The rams generally have spiral horns. There are, however, also some hornless Tzigaia rams, and the ewes generally have no horns; but there are also to be found some ewes possessing sickle shaped horns. It is stated that the hornless animals are more suitable for fattening; for this reason, only hornless rams are used for breeding purposes.

The ewes weigh 30-45 kgs. and the rams 45-60 kgs. The height at withers is 60-75 cm. in the former and 65-80 cm. for the latter. The length of body is about 100-110 % of the height at withers.

The Tzigaia sheep is of triple capacity. The fleece is composed exclusively of down ; the wool fibre is white, more or less spotted black, 30-50 microns thick or more rarely, 25-30 microns, so that this wool is generally graded C-D. It possesses a brilliant lustre. The length of the locks is for the ewes, 5-8 cm. and for the rams 6-10 cm. The weight of fleece of the ewes varies from 1 to 2 or 3 kgs., being generally 2 kgs. From the rams 2-4.5 kgs. (on the average 3 kgs.) of greasy wool is obtained. The yield is 45-60 %. The grease is yellowish, oily, easy to extract by washing and of average quality. The wool serves for the manufacture of fine cloths, mesh tissues and, as it shrinks well, of " loden " articles.

The suitability for fattening of Tzigaia sheep is much superior to that of the other strains which have not been graded-up.

As regards milk production, after a suckling period of 6-16 weeks, there are obtained during the following 4-6 months, 30-60 litres or on the average, 40 litres of milk per ewe.

Naturally, there are to be found some ewes greatly exceeding this yield.

The Tzigaia sheep is a strong hardy animal, resistant and requiring little attention. It still maintains itself in good condition if, during the winter, it is kept under an open shed and if it is obliged, apart from the few handfuls of straw which it is given, to search for food beneath the snow.

In some flocks, the Tzigaia sheep are crossed with those of eastern Friesland. The result is fairly good ; the production of milk and the size of body are visibly increased, the wool becomes finer and fecundity is raised.

THE HUNGARIAN RATZKA SHEEP. — In the XIXth century, the Ratzka sheep constituted practically the sole strain on the great plain ; today, there are not to be found more than a few thousands of these sheep in the Hortobágy area and, sporadically, in the areas of Békes, Csongrád and Pest. But, even in these areas, it is slowly being supplanted by the combing wool sheep.

The rams and ewes have cork-screw shaped horns of a brown-black colour, the axes of which diverge at an angle of 60 to 90°. The length of the rams' horns is 55-60 cm.; those of the ewe are half the length and thinner. There are also some hornless ewes. The colour of the fleece is reddish, greyish-brown, black, dirty yellow or white. The new-born lambs of the dark coloured Ratzka sheep have a black, brilliant and curly fleece which is greatly sought for as fur to trim hats, collars and furs. At the age of 4-5 months, the fleece slowly loses its brilliance ; there are some reddish and white locks, so that the fleece soon becomes grey in colour. The curls also become looser. The black lambs which it is not desired to retain are slaughtered at the age of 2-3 weeks for the production of fur. The best fur for hats is furnished by the black lambs of dark coloured parent animals. These animals are preferred by some breeders ; but on the great plain, the preference is given now rather to white animals, the skin of which serves to make the peasants' white furs and which is also greatly in demand by weaving and felt factories etc., as they are easy to dye.

The live weight of the ram is 50-70 kgs., that of the ewe 40-50 kgs. The height at withers is 75-85 cm. for the former and 70-75 cm. for the latter.

The fleece of the ewe weighs 1-3 kgs. ; that of the ram 2-3 kgs. In exceptional cases the ewes yield 5-6 kgs. of wool from two shearings. The fleece is not composed of locks but of long smooth fibres ; the coarse hairs have a thickness of 46-140

microns and on the average 60-80 microns ; the down fibres have a thickness of 30-40 microns. The coarse fibres are dull while the down fibres are lustrous.

Apart from the milk consumed by the lambs, the Ratzka ewes do not give more, on the average, than 30-40 litres of milk, as the pastures are already dried up during the principal period of lactation and the ewes can feed themselves only with difficulty.

The Ratzka sheep is very resistant, and hardy and requires little attention. Even in the winter it does not absolutely need a closed shelter. It can also find food as well under the snow as on the dry and scorched pastures of the alkaline lands ("szik").

OTHER STRAINS REARED IN HUNGARY. — Eastern Friesland sheep were already imported in the period 1870-1880. There still remain some pure bred flocks of this type. The best results with these sheep have been obtained at the Experimental Farm of the Royal Academy of Agriculture of Hungary at Magyaróvár. The flock, selected on the basis of milk production records, produces, if it is given appropriate feed, an average of 500-600 litres of milk, some ewes even yielding 800-1000 litres.

In introducing this race however, there was no intention to create in Hungary pure-bred East Friesland flocks, but to increase, by crossing, the milk yield of native milk strains (Tzigaiá, Ratzka) and also to improve the quality of wool of the Ratzka. These experiments have given good results. The crossbreds of the first generation possessed the following advantages : (1) a doubled milk yield ; (2) a larger quantity of hair and down, so that the wool became of quality C-D ; (3) a doubled weight of fleece ; (4) the lambs resulting from the crossing had twice the live weight of the Ratzka lambs of the same age ; (5) the number of twin births doubled (25-30 % against 10-14 % for the pure bred Ratzka of the same flock). Even the products of the crossing of Tzigaiá with Eastern Friesland have proved to be capable of increasing their milk yields.

While increasing their yields, the crossbreds of course required more feed and were more susceptible to disease. For this reason, stock farmers are now of the opinion that it is preferable to preserve in such a mixed flock only 1/2 to 3/4 of the Eastern Friesland blood.

There are also in Hungary some flocks of Hampshire down sheep, but their importance is only secondary as, in the present economic conditions, there occurs a degeneration of their earliness, fecundity and size. Due to their low priced wool and fatty meat they have given way to meat Merinos. On the contrary, the Hampshire down rams have proved to be suitable for crossing with Merinos for the production of lambs for roasting. The crossbred lambs possess a greater energy of growth and a greater capacity for fattening than the pure-bred Merino lambs and their meat has a better market as it is graded between the choice and better qualities.

There are three flocks of pure-bred *Karakul* sheep. These sheep are also sometimes used for crossing with the Ratzka. Compared with the fur of the Ratzka lambs that of the crossbreds is more lustrous in the first generation, and, in the third and fourth generations, already greatly resembles the fur of the true *Karakul* sheep.

THE WORK OF BREEDING AND ITS TENDENCIES. — Sheep breeding is of great economic importance to Hungary. It must not be overlooked that only sheep, with their great mobility and the appropriate shape of their mouths, can utilise the short grass of the dried up, stony and alkaline pastures and grass growing along the road-

side, in quarries etc. Generally, the flock grazes for a quarter of the year on occasional pastures, on too abundant sowings, stubble, etc. It is also important that sheep can utilise well feed in the form of cereal straw or other kinds of straw such as that of pulses, colza and poppy, that is, products the economic utilisation of which is of great importance to Hungary. This explains why formerly there existed enormous flocks of 100,000 sheep and why even today there are still to be found flocks of 20,000 or 30,000 animals.

* * *

Until quite recently, Hungarian breeders have been particularly concerned with wool production.

There exist flock-books of the latter half of last century which may serve as models for careful selection. Magnificently edited albums contain photographs of each animal of the foundation flock of the strain and data on all the qualities of the wool.

The work of selection has not ceased even in the present century, although the value of the wool is already on the decrease. Every good sheep raiser has nevertheless made estimates of his sheep and special interest has been displayed in compensatory crossings, by the aid of which uniformity is obtained in the flock. In the post-war years, it has become quite general to note the weight of the fleece and in this manner an exact basis for selection has been obtained. In 1928 there was established an official national flock-book for the compilation, according to exact methods, of data on the most valuable economic qualities of the better animals. In this flock-book are entered all the data on the value for utilisation and reproduction of the animal registered, for example: genealogical table (3 generations) — rate of growth — size and body measurements (height at withers, length of trunk, depth of chest, width of crupper, perimeter of canon bone) in absolute and relative figures. The favourable or unfavourable body formation, which cannot be expressed in figures, are entered in the form of notes.

As qualities characteristic of the wool, the following data are entered: thickness of the wool fibre (in microns) — length of the locks (in cm.) — structure of the fibre — quality of the grease — uniformity, continuity, surface and thickness of the fleece expressed by the corresponding values.

There are also added the annual entries for: weight for fleece — weight of the wool — fecundity — and data of milk production.

In general, great importance is attached to the entire correspondence of the flock-book to the requirements of modern breeding principles, i. e., that it must give a clear impression of the value for reproduction and utilisation of each sheep while avoiding unnecessary expense and labour of no practical utility in its preparation.

The elaboration of the material is effected at the Royal Hungarian National Institute for the grading of wool. On shearing day, an assistant from this Institute visits the sheep farm and, before shearing takes from each fleece a lock which is weighed very exactly on an analytical balance and taken to the Institute in a small waterproof bag. After being washed and dried at the Institute, the wool sample is used to determine the "weight of the wool" and the thickness of the fibre. Further, the assistant making the test has also to determine, at the farm, the weight of the sheep and the fleece and also, for sheep aged 4 years, the body measurements.

This method of examining the results of washing of small samples of wool (20-40 gm.) has had to be adopted because the sending of the whole fleece would

have compromised the success of the whole system. Moreover it has been ascertained that the results obtained fulfilled practical requirements.

The other data concerning the quality of the wool (length of lock, internal structure, quality of the grease) are also estimated numerically by recognised experts during the visits of inspection made to the sheep farms from February to April, and these figures are similarly entered in the flock-book.

The sheep farmer himself has only to collaborate by keeping a register of his animals in which are entered the lambs, the numbers of the parent ewe and ram and the live weight at the age of 3 months, 1 year and 2 years.

Certified copies of the flock-book sheets are also kept at the Chamber of Agriculture of the region and may be consulted there. Breeders may also obtain certified copies there or certificates of origin.

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It is known that the price of wool has fallen increasingly during recent years. The drop in prices having been relatively small for fine wools used in the manufacture of cloths, some breeders are seeking sheep furnishing this kind of wool, whereas others are trying rather to obtain a better yield by the multiple utilisation of Merinos.

Until a short time ago, Hungarian stock farmers have considered the Merino only as a wool sheep. No importance has been attached to its milk production; the lambs were allowed to be suckled for three or four months and, after weaning, the ewes were allowed to dry up, except in the great plain regions which formerly raised Tzigaña and Ratzka sheep considered to be milk sheep. There also the combing wool Merino has replaced the animals formerly raised, but, on the small and sometimes on the large farm, the new ewes were regularly milked. But, in general, this utilisation was exceptional and, among the flocks intended to produce fine wool or meat, it was very rare.

The small importance attached to milk production was due to several reasons. There was, for example, a widespread opinion that the milk production of the Merinos was so insignificant in relation to that of the Tzigaña and the Ratzka that it could not even cover the cost of milking. It was also stated that there could be no question of a true utilisation of the milk unless the lamb was weaned early and received concentrated feed instead of milk. But, in this case the increase in expense due to the concentrated feed and the inferior development of the lambs renders the profitability of milk production doubtful. Other breeders assert that milking has a bad effect on wool formation and that the wool of ewes which have been milked suffers such quantitative and qualitative losses that the latter would not be compensated for by increased profits obtained from the production of milk.

The Royal Hungarian National Institute for the grading of wool proposed to study this problem experimentally.

For this purpose it has initiated, on 5 sheep farms, having very different economic conditions, milk tests for 50 ewes on each farm. The following table summarises the results obtained:—

	Sheep farm No. 1	Sheep farm No. 2	Sheep farm No. 3	Sheep farm No. 4	Sheep farm No. 5
Number of ewes	50	50	38	50	50
Length of suckling period of the lambs	14 weeks	13 weeks	7 weeks	12 weeks	12 weeks
Length of the milking period	68 days	81 days	96 days	51 days	67 days
Milk yield for the farm	1126 litres	760 litres	1864 litres	860 litres	780 litres

From these results it appears that there may be obtained in Hungary from combing wool Merino ewes milked after a weaning period of 3 months, an average of 12-14 litres of milk per month and per head ; the value of this milk is today equivalent to 30-50 % of the value of the wool production.

The individual fluctuations of wool production are large also for the Merinos. In the same flock there were some animals, which, while receiving the same feed and the same attention, produced double the average quantity, others producing only a quarter. Apparently there exists, among Merinos, very good lines as regards milk, the selection of which would constitute promising work. It has hardly been possible to observe for cattle, the similar differences in milk production (for example, differences of 5 or 10 or even 15 times, among animals receiving the same food and care). A selection based on milk yield would not only have the effect of improving the milking results, but would also contribute to increase the growth of the lambs. The descendants of ewes giving high yields of milk would gain in size rapidly and without great expense.

Another problem of no less importance is to know if there exists a relationship between size of body and milk yield and to know the nature of this relationship, that is to ascertain which are the best milk producers : the sheep of small size or the larger ones. If the best milk yield were a function of a smaller size, selection along these lines would require some prudence in the interests of production of wool and meat.

Calculations from correlations made in this respect demonstrate that, for combing wool Merinos weighing 30-60 kgs. the milk yield varies independently of size. Thus the problem could not have the solution that the largest or smallest ewes yield the most milk, but rather that among the other and intermediary cases, there are animals differing enormously in their milk production. From the breeder's point of view, this result is very useful, because, as has already been indicated, a selection based on milk yields does not exclude the breeding of large sized sheep suitable for the production of wool or meat.

Finally, the conviction remains that milking for 1 to 2 months effected on the pastures after three months of suckling produces a loss of only 1-2 % in quantity and quality of the wool. The final conviction is therefore that regular utilisation for milk of Merinos is completely justified from the economic point of view.

* * *

The fall in wool prices has also had an influence on meat production. While, formerly the sheep were generally kept and not fattened and sold until the age of 3 or 4 years, today breeders fatten the surplus lambs immediately after weaning and sell them after a fattening period of 3 to 5 months at a live weight of 35-45 kgs. per head. The results obtained show that Merinos give good results from this point of view also.

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It is to the activity of breeders as above indicated and to the hard work of the agricultural organisations that the Hungarian farmer owes the possibility of deriving further benefits from sheep rearing despite the disastrous fall of prices on the wool market. The Hungarian Agricultural Society (O. M. G. E.) and the Chambers of Agriculture are making extensive propaganda for the diffusion of new information and the Royal Hungarian National Institute for the grading of

wool supports and directs, by its researches, the work of the breeders. The Agricultural and Livestock Exhibition held every spring at Budapest, provides a good opportunity to buy rams for breeding purposes. The wool is also sold at auction sales organised also at Budapest at the beginning of July every year. The milk is mostly bought by the National Centre of Dairy Co-operatives ("Orsz. Tejszövetkezeti Központ"), which exports, under the name of "Hortobágy cheese", the cheese made from this milk. The fat lambs are almost all exported through the agency of the Hungarian Institute for Agricultural Export.

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AGRICULTURAL INDUSTRIES

Present-day Knowledge of Fermented and Acid Milks.

Wherever the milk of animals is used as food, more or less palatable preparations have long been made from sour milk. The more important of these are of the condensed milk type resembling cheese, but in the course of centuries methods have been developed in many parts of the world of so managing the acid fermentation that the casein is not deposited but remains finely sub-divided in suspension in the milk. This state of the casein is produced by special processes of lactose fermentation which make it possible to use the product thus obtained as a beverage. The changes set up in the milk are due to bacterial activity, a fact of which the early producers could naturally have no idea. It is only in recent years that a thorough study of the subject has been made and even now complete investigations have not been made in respect of some of these products.

This article will deal with the preparation,, composition and especially with the bacterial flora of some of the more important acid and fermented milks, and also of certain products recently placed upon the market, such as acidophilous milk and Saya.

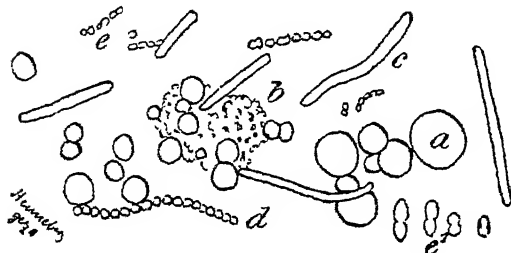
YOGURT. — Yogurt originated in the Balkans, in particular in Bulgaria. To prepare it either cows' or sheep's milk may be used. The milk is boiled until it is reduced in volume by one-third, then when it is cooled to 45° C. it is seeded with a pure culture of *Bacillus bulgaricus*, or with fermented milk (Yogurt) of the day before. The container, which must be moved with great care, is then wrapped in cloths or placed to stand in water of the required temperature so as to cool it off gradually. After three or four hours when the temperature has fallen to 35° C., the Yogurt is ready for use. It is a thick milk, slightly acid with an agreeable aroma. It must be kept cool to check further formation of acid. To prevent separation of the whey from the curd, the milk must be kept absolutely at rest during and after curdling.

Bacteriological investigation carried out hitherto show that the bacterial flora of yogurt varies considerably according to the region of origin. The presence of yeasts and of *Oidium* may however always be regarded as a contamination, whereas the original yogurt invariably contains *Bacillus bulgaricus* (GRIGOROFF), either the non-granular (free from volutin droplets), acid-forming variety named by JENSEN

Thermobacterium Jugurt Jensen, or the granular producing little acid, named *Thermobacterium bulgaricum* Jensen, or both varieties along with other rodshaped lactic acid forming bacteria, and sometimes also *Streptococcus cremoris* or *Str. lactis*, alone or associated with *Streptococcus thermophilus*. According to HENNEBERG, for the preparation of a good yogurt the *Thermobacterium Jugurt* Jensen free from volutin, which HENNEBERG also names *Bacterium bulgaricum*, is required mixed with a good strain of *Streptococcus thermophilus* in suitable proportions.

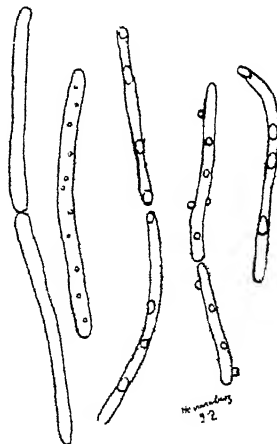
To maintain the required proportions of the two organisms, the temperature must not be too high and fermentation must not be allowed to proceed too far, because the *Streptococcus* would be eliminated in either case, and the resulting Yogurt would be too acid. On the other hand too low a temperature will allow an increase in the *Streptococcus* as compared with the *Bacterium bulgaricum*, and the product

FIG. 1. — Yogurt as seen under the microscope.



- a = Fat globules.
- b = Casein flakes.
- c = Yogurt fungus (*Thermobacterium Jugurt* Jensen) without droplets of volutin.
- d = *Streptococcus thermophilus*.
- e and e1 = *Streptococcus lactis*.

FIG. 2. — Yogurt fungus with droplets of volutin (revealed by the methylin blue stain).



will be a sweet, aromatic thick beverage which however cannot be called yogurt. The presence of yeasts is also due to too low a temperature.

The cultures of these bacteria can be carried for several years, if they are conducted properly and degeneration is not produced. As to the preparations in tablet form, powders, etc., *i. e.*, dry preparations, they are not to be relied upon, particularly if not very fresh, because most of them when actually sold contain no active principle. Preparations of good keeping quality intended for export have been introduced by HENNEBERG, who adds chalk.

The chemical composition of Yogurt is given later in this article in conjunction with that of "Tarho".

The following are some patents for the preparation of Yogurt :

Patent 269,598. — The necessary quantity of milk is first sterilised ; then a portion of it at a temperature of 45° C. is seeded with about one per cent. of pure culture of paralactic bacilli, similar to coccus, so that the milk curdles forming a layer of whey on the surface. A second portion of sterilised milk is treated in the same manner with the Bulgarian bacillus. The two products well cooled are then mixed in the proportion of 1 to 10. In this way the secondary souring becomes a slow process.

Patent 276,452. — Ten litres of yogurt yield 2000 g. of casein and 8000 g. of whey. The latter is boiled with 1500 g. of saccharose until the volume is reduced to 1750 cm³. The clear syrup, thick, optically active, is cooled to 30° C. and mixed with the casein. A yield of 3750 g. of a condensed yogurt is thus obtained. The concentration and preservation of other products based on sour milk may be effected in a similar manner.

Patent 285,211. — Mix heated milk, if possible germ-free, normal or condensed, cooled to 45-55° C., with pure citric acid, dissolved (from 0.5 to 1 g. per litre), and with a pure culture of *Diplostreptococcus bulgaricus*. This latter, if liquid, is used in the proportion of one to two per cent. After having well mixed the inoculated substances, add a further one per cent. of pure liquid culture of *Bacterium bulgaricum*, which has been kept for half an hour at a temperature of 60° C., and thus rendered less acidifying. Put the milk so treated into hermetically sealed bottles, and leave to ferment at 40-50° C. until it coagulates.

“TARHO”. — This is a product resembling Yogurt, obtained through the action of thermophilous and lactic acid-forming bacteria and of certain varieties of *Streptococcus*, at a temperature of about 40° C. It is prepared as follows: boil some cows' milk (in certain districts sheep's milk may be used), then let it cool to 40-50° C. To each litre of milk add a teaspoonful of Tarho which has been previously prepared. If this is not at hand, the contents of the stomach of sucking calves or lambs may be used. Further, the culture for inoculation may be obtained by allowing cream, boiled or unboiled, to go sour over a period of ten days. The product is then seeded on to milk. The Tarho thus obtained is however of inferior quality.

Tarho has the appearance of liver, its taste is acidulous, and resembles that of Yogurt.

In the following table the composition of Tarhò is compared with Yogurt.

	Tahrò	Yogurt (COMBE)
Water	88.25 %	73.69 %
Solids	11.76	26.31
Fats	1.40	7.20
Proteins	4.50	—
Casein	3.99	2.10
Albumin	0.14	0.98
Albumose-peptone	0.34	3.75
Lactose	4.50	9.40
Lactic acid	2.00	0.80
Alcohol	0.37	0.20
Ash	0.85	1.38

“SOSTEJ”. — This is prepared from the milk of sheep, buffaloes or cows. It is a special product, somewhat resembling the “Oxygala” of the Rumanians, and the “Herbstmilch” of Lower Bavaria. It is best to use sheep's milk of the last lactation period, which occurs generally in September or October. “Sostej” is

prepared as follows : Pour the filtered milk into a deal box, the lid of which must have an opening of about 3 cm². Add immediately some drops of lamb's rennet and close the aperture at once. The box should be kept in a cool place where the air is pure. At the end of a fortnight remove the whey; if it is desired to preserve the acid milk for the winter, the whey must be removed again a fortnight later, and once more at the end of three weeks. According to SZENTKIRALNI, a great deal of experience is required to prepare a good "Sostej", and it can be made of boiled or unboiled milk; two receptacles are used, one small and the other larger; the smaller has an aperture which can be stopped with a finger. In this receptacle the milk is coagulated with a drop of rennet, and poured out through the hole into the large receptacle. It is then left undisturbed for 18-20-24 hours at a temperature of 20-25° C. until it curdles, the curds are then separated from the whey and poured into small wooden casks that have been washed in boiling water. Leave in a well-ventilated, cool and dry place, where fermentation will take place. If moulds are seen to be forming on the sides of the casks, continue to wash them with boiling water. Dip a little smooth stick from time to time into the curdled milk, and note whether whey gathers in the opening after the stick has been removed. If it does, slacken the hoops of the casks a little to allow the whey to flow. Fill the remaining space with fresh "Sostej", and close the receptacle immediately very tightly.

BAINTNER has made a full analysis of "Sostej". The minima and maxima proportions of the components are as follows :

Water.	68.3	78.6 %
Solids	21.4	31.7
Proteins	5.9	13.8
Lactose	0.16	2.49
Lactic acid	1.0	2.2
Water soluble Proteins	1.17	3.36
Ash	0.95	1.36
Common Salt in the Ash	7.7	18.5

The solids contain a 50 % average of fats. The salt content is very high, although salt is not directly added; the NaCl comes, according to BAINTEER, from sheep stomachs preserved in salt: but sometimes salt is added to the product during preparation.

This acid milk contains the microbial flora of a milk which has been allowed to go sour over a long period.

A product resembling "Sostej" has for some time been known to the Rumanians and is called "Oxygala". This is prepared by putting milk into a wooden receptacle, closed, but with a perforated floor. Aromatic herbs are then added and the whey removed after several days. The herbs are immediately strained off and crushed salt is added. "Oxygala" differs from "Sostej" only as regards the addition of the aromatic herbs.

"LEBEN". — This is a milk curdled by means of special ferments, and is prepared in Egypt and in Lebanon as follows: the milk, previously sterilised by boiling is seeded with "robb", i. e., with the "Leben" of the day before, the milk being

at a temperature of 51-53° C. For one litre of milk 20 g. of " robb " are sufficient. The mixture should be kept from the cold, generally in an oven at a temperature varying between 35-53 C. " Leben " prepared in this manner is of a gelatinous consistency ; when coagulation is slow the cream rises to the surface immediately forming a more or less thick layer ; if coagulation is rapid, the cream has not time to separate completely.

The taste is agreeable and not acid. " Leben " is used as a beverage ; it is also used in the preparation of a great number of foods in the Lebanon, and also in the preparation of a kind of cream cheese called " Leben ". If " robb " is not available, the hot milk is seeded with " khamyre " (leaven). The first day the " Leben " is not good ; but after several days it is easy to obtain a very good preparation.

It has not been ascertained whether the bacterial flora of Leben is identical with that of Yogurt. It appears that the normal fermentation of Leben is produced by a yeast which transforms the lactose (previously decomposed by bacteria very similar to those of Yogurt) into its components ; alcohol and carbonic anhydride. In the case of both Leben and Yogurt, the lactic fermentation supersedes the alcoholic fermentation.

P. GUIGUES obtained the following results in his analysis of Leben, referred to 1000 g. :

Density at 15°	1.0357
Lactic acid content	16.35 gm.
Ammonia	0.376
Extract at 100°	137.73
Water	862.27
Butter	33.84
Casein	47.37
Lactose hydrate	31.47
Ash	6.88
Phosphoric acid	2.49
Total nitrogen	6.20

" GIODDI ". — This beverage, derived from milk by means of special ferments, is a speciality of Sardinia. GRISCONI has discovered that the principal microorganisms are a yeast (*Saccharomyces sardous*) and a streptobacillus (*Bacillus sardous*), the two being in permanent symbiosis. According to the tests made by FIDANZA, the principal fermentation occurring in " Gioddu " is lactic, the alcoholic fermentation is completely subordinated ; a breaking down of fats has been observed but no proteolysis. " Gioddu " is acidulous and somewhat alcoholic like the " Leben " of Egypt and the " Tätte " of the North. It may be prepared from sheep's milk, goats' milk or cows' milk, by adding previously prepared " Gioddu " which sets up the fermentation. In Sicily a similar product is found, known as " Mezzoradu ".

" TÄTTE ". — The products called *Taette Mjoelk* (Norway), *Lang Mjoelk* (Sweden), *Fisli* (Finland) prepared from whole milk, and *Pismae* (Finland) prepared from skim milk, constitute the " *lait long* " of Northern countries. Tätte owes

its special constitution to a species of bacteria and to the permanent symbiosis of certain determined species of bacteria and yeasts. The species contributing to the production of "Taette" are: a *Streptobacillus Taette*, the *Lactobacillus Taette*, numerous types of yeasts (usually *Saccharomyces Taette major* or *minor*) and often also certain varieties of *Torula*. It is *Streptobacillus Taette* that gives this decidedly acid milk its ropy consistency. It keeps a long time, is uniformly granular, contains carbonic anhydride, an average of 0.3-0.5 % of alcohol, traces of acetic acid and a little peptone along with casein, suspended in the liquid in very fine subdivision. There are two types of this acid milk: the true and the false "Taette". The first may be recognised from the second by the fact that it may be kept for several months, without undergoing any marked change and without spoiling. OLSEN-SOPP gives the following formula for the composition of "Taette".

	Milk	Taette about 6 weeks old	Milk	Taette several months old
	%	%	%	%
Water	87.19	88.04	37.30	89.56
Fats	3.85	3.36	3.72	3.60
Proteins	3.85	2.84	3.55	2.76
Lactose	4.94	3.67	4.68	1.60
Lactic acid	—	1.44	—	6.80
Crude Ash	0.78	0.65	0.75	0.68
	100.00	100.00	100.00	100.00
Specific weight	1.0326	1.0240	1.0824	1.0234
CO ₂	—	0.60%	—	0.12%
Alcohol	—	0.37%	—	0.48%

KEFIR. — The essential ferments are found in white convoluted grains, the size of peas or at most of nuts. The larger grains are usually made up of dead masses and fungi species. Good quality grains should be firm to the touch and not viscous; grains containing dead fungi are spongy, viscous, often yellowish, with a disagreeable odour. Dry or old grains are usually valueless and may be harmful. Kefir will ripen more quickly if large quantities of grains are used in its preparation.

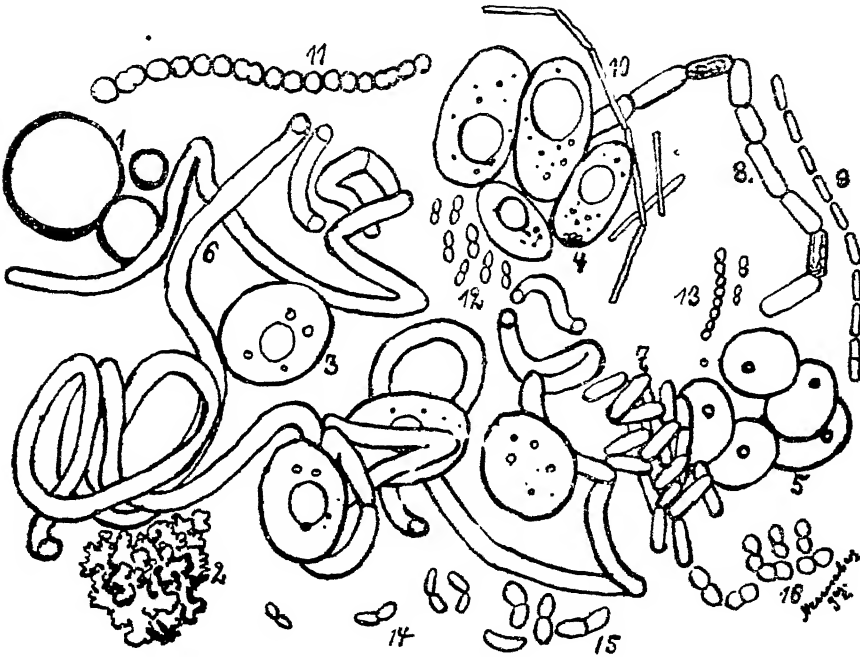
In order to obtain a good Kefir, care must be taken that the different bacteria are in correct proportion, for if there are too many yeasts the fermentation of the milk is too strong, while if there are too few, the taste will be that of an ordinary acid milk. If on the other hand, there is an excess of lactic acid bacteria, the Kefir becomes too acid, while a shortage will cause it to lack flavour. Finally if there is a deficiency of the rod-shaped Kefir bacilli which render the cheesy mass soluble, the Kefir loses its characteristic consistency of a thick liquid. If a vinegary taste is observed, the Kefir is contaminated by fungi, which are transforming the alcohol present into acetic acid.

On shaking the bottle, a well prepared Kefir should have the appearance of a slightly acid milk, frothing moderately, and should have a very pleasant taste and the consistency of cream. Provided that Kefir is prepared from boiled milk, it may be recommended as a hygienic beverage. Skimmed milk may be also used and gives a good Kefir.

Microbiology of Kefir. — A number of researches have been made on the bacterial flora of Kefir and VON FREUDENREICH was the first to distinguish the micro-organisms contained in it. He found 4 varieties of fungi, prevailing almost constantly in the samples coming from different places: a yeast (*Saccharomyces Kefir*) and three species of bacteria; two species of coccus, which he called *Streptococcus* a

and *Streptococcus* b and further the *Bacterium caucasicum*. As regards the yeast, it has been possible to determine that it can only cause fermentation of inverted lactose and that lactose is inverted by the bacteria of lactic acid. FREUDENREICH was unable to obtain pure cultures of 3 out of the 4 organisms of Kefir, but succeeded in obtaining a regular fermentation, proper to Kefir, by means of pure cultures

FIG. 3. — Kefir as seen under microscope.



- 1 = Fat globules.
- 2 = Casein flakes.
- 3, 4, 5, = Three different kinds of yeast.
- 6 = Kefir bacillus showing its characteristic convolutions.
- 7, 8, 9, 10 = Four different lactic and acid forming rod-shaped bacteria.
- 11 = *Streptococcus cremoris*.
- 12, 13 = *Streptococcus lactis* (different kinds).
- 14, 15, 16 = Various acetic acid bacteria (contaminating).

of these four fungi in symbiosis. The relation in which the different species are found would seem to be of great importance.

According to W. KUNTZE, there are two principal bacteria specially active in producing fermentation of Kefir and these bacteria live in symbiosis with the yeasts.

W. HENNEBERG has gone deeply into this subject and considers that the true bacillus typical of Kefir is not the *Betabacterium caucasicum*, but a species or modification of the *Bacillus subtilis*. The grains of Kefir then, consist of formations obtained by natural symbiosis, and have, as chief component, the *Betabacterium caucasicum*, or, according to HENNEBERG, a kind of *Bacillus subtilis*, the *Saccha-*

romyces Kéfir and probably one or more varieties of *Torula* accompanied by the common bacteria of lactic acid, of *Streptobacterium caucasicum* (*Bac. caucasicus* or *Dispora caucasica*) and of other types of yeasts and of *Torula*.

The following are some methods of preparing Kefir :

According to WEIDEMANN : bathe the grains 3 times in a bath of tepid water and then wash with care on a sieve, pouring over it a litre of pasteurised milk and letting the whole remain for 24 hours at a temperature of 15-18° C. The next day, decant and filter the milk, adding new milk over the remaining grains. Repeat this operation for several days, until all the Kefir grains which were at the bottom of the receptacle have risen to the surface. Kefir is then prepared as follows : dilute with a quantity of triple milk, then bottle and leave for 24 hours at a temperature of 15-16° in order to produce the secondary fermentation. To continue the preparation of Kefir, add the following day, to the bottles already prepared, ten times their volume of milk and continue so doing until required aroma and flavour are obtained. It is a good plan to take fresh granules every day, or else to add fungi every eight days. The latter should be freed from excess acidity with a 1 % soda solution. In this way they keep indefinitely.

Kefir, prepared in large quantities, however, undergoes changes, and SALIÈRES has taken advantage of this defect and has succeeded in separating the two active components of the commercial ferment : a species of yeast and the bacillus *Dispora caucasica*, and has employed their pure cultures in the preparation of Kefir. SALIÈRES proceeds as follows : The skim milk is sterilised, seeded with pure cultures and then left to ferment for 9 or 10 days in copper-plated receptacles. During this period, the lactose decomposes almost completely ; the product, always protected from germs of the air, is put into sterilised bottles, and after a more or less long preservation in a cellar, is ready for use. Kefir keeps for one or two months according to the season, after which diastatic ferments form which change the product completely. The product thus obtained contains only traces of sugar and about 2 % alcohol, while the two-day Kefir, prepared in the old way, contains about 20 g. of sugar per litre and only 0.8 g. of alcohol.

In addition to the alcoholic fermentation, of which the secondary products are carbonic acid, glycerine, succinic acid and acetic acid, the lactose is transformed into lactic acid. Mature Kefir contains 7 to 8 g. per litre. In spite of the high degree of acidity, coagulation of the albuminoids does not occur because they have been peptonised by the further action of the ferments. It is precisely to its content of peptonised albuminoids that Kefir owes its properties of an easily digestible food, while the carbonic acid and the alcohol it contains make it agreeable.

KUMISS. — Also known as “ vin de lait ”, is best prepared from mare's milk in slightly acid alcoholic fermentation, though ass's milk, camel's milk and goat's milk are occasionally used. It forms a froth like skim milk and contains casein under the form of a coagulum, in fine suspension. Kumiss comes from the steppes of Southern Russia, where it is usually made of mare's milk and sometimes from skimmed cow's milk. Certain peoples carry out the fermentation in 25 to 30 litre bags of horse-leather ; others in receptacles of linden wood. Each receptacle is furnished with a stirring rod, about one metre long. The longer and stronger the shaking of the mass the more the curd forms a fine precipitate and the more uniform, granular and of good quality, in consequence, the Kumiss becomes.

To produce fermentation, the Kirghiz use old dried Kumiss. According to FLEISCHMANN, pressed yeast may be used in the preparation of Kumiss : 100 kg. of whey are mixed with 72 kg. of water, 1.75 kg. of sugar, 0.75 kg. of lactose

and 160-180 kg. of pressed yeast. The whole is left at a temperature of 37° C for two hours, stirred 6 times, then put into strong receptacles and kept for 5 to 6 hours at 12° C. After bottling it is left from 3 to 7 days in the refrigerator; Kumiss begins to froth as a result of the secondary fermentation. Good Kumiss is very like Kefir, though less refined. In Russia and in Switzerland, it is used therapeutically, and there are special cure establishments under medical control. The chemical composition of the product is uncertain. It can at any rate be said that that of Kumiss 6 to 8 days old, with a specific weight of about 1.008 at 15° C, is somewhat as follows:

	Kumiss prepared from mare's milk	Kumiss prepared from skimmed cow's milk
	%	%
Water	91.535	83.083
Fats	1.274	0.854
Albuminoids	1.013	2.025
Sugars	1.253	3.108
Ash (Salts)	0.238	0.444
CO ₂ free and combined	0.876	1.027
Alcohol	0.050	2.047
Glycerine	—	0.166
Lactic acid	1.006	0.796
	100.000	100.000

According to HOROWITZ-WLASSOWA, the real Kumiss ferments are small gram-negative rods resembling "coccus", and a *Torula* which lives with them in symbiosis. It is possible to prepare the true kumiss with the *Bacterium Orenburgii*, the *Bacterium bulgaricum* and the *Torula Kumys* in symbiosis, starting from fresh mare's milk, camel's milk or goat's milk; but it is not possible with cow's or mare's milk sterilised some considerable time previously. The *Bacterium Orenburgii* develops very well in sterilised acid Kumiss to which 4 % of agar has been added. The *Torula Kumys* brings about an abundant formation of CO₂. According to the same writer, Kumiss is prepared by the careful addition of milk containing a culture of yeast and a culture of mixed bacteria to sterilised mare's milk, and then allowing the whole to remain at a temperature of 35-37° C for 24 hours. About 30 cm³ of this product is then added to fresh mare's milk (at 25° C) in a bottle, and it is shaken up several times. This "acid" culture serves for the preparation of large quantities of Kumiss, when always mixed with new fresh mare's milk.

In commercial production linden wood boxes are used. The "acid" culture is added, and then, little by little, ever increasing quantities of fresh mare's milk.

"ESPRIT DE LAIT". — The preparation of intoxicating drinks obtained through the distillation of fermented milk (sheep's or mare's) is very old. The first (sheep's milk) is known as "Airan", the second (mare's milk) "Arakà" or "Ojran"; a mixture of mare's milk, skimmed sheep's milk and cow's milk gives the drink known as "Arsa". Camel's milk also provides an alcoholic drink. Fresh milk may undergo alcoholic fermentation if milk already in a state of fermentation is added, or if it is well shaken up with a yeast prepared from barley flour or oat flour. The "Esprit de lait" contains as much as 8 % of alcohol.

ARAKÀ. — This is a drink known in Siberia but which does not appeal to Europeans. Its preparation is very primitive: the milk is allowed to ferment in large

receptacles, it is then distilled into primitive stills. Arakà is very intoxicating. The first product of the distillation contains 7 to 8 % of alcohol ; by continuing the distillation and by eliminating the volatile acids a more palatable liquid, richer in alcohol is obtained.

SKYR. — A drink similar to kumiss, prepared in Iceland. It is produced by acid fermentation of milk, to which lime has been added, the whole being concentrated to a syrupy consistency.

PRUTRA. — A beverage similar to Kumiss, prepared in Lapland from reindeer's milk.

" SAYA ". — This is a new acid milk product which has appeared on the markets during the last year or so. It is obtained from pure, unboiled milk by means of a specific fermentation of six weeks at low temperature, in an oxygen-free medium. During this long fermentation, the albumin of the milk is decomposed so that the mature Saya contains, in soluble form, about 55 % of the nitrogen total of the milk. The proportion of nitrogen present in the Saya under the form of amino-acids is almost four times superior to the proportion of nitrogen in fresh milk.

The carbonic anhydride content of Saya (0.4 %) should also be noted, as it combines the reviving action of beverages containing carbonic anhydride and the advantages of the colloidal structure, thus rendering this drink more palatable and more digestible than simple Seltzer water. Compared with Kefir, Saya has a minimum alcohol content (about 0.03 %).

According to DEMETER fermentation takes place in the first phase under the action of *Streptococcus lactis* and the bacteria of *Streptococcus paracitrovorus* (*Strept. Kefir*), whereas, in the second, the lactic acid rod bacteria predominate. The albumin thus decomposes and, at the same time, the degree of acidity becomes ten times as great.

Tests on the vitamin content of Saya show its high content in vitamins A, B, C, D, and its superiority in this respect, over Kefir, Yogurt and fresh milk ; thus Saya contains 4 times more vitamin A than does fresh milk and about twice as much of vitamin C and D. This may be attributed to the following facts : during the preparation of Saya, the milk is not heated, and all possible oxidation is avoided ; further, the vitamins are in an acid medium where they are better preserved. It has not yet been possible to determine if the increase of the vitamin content is due to an activation.

There are two preparations of Saya on the market : the one obtained from whole fresh milk, the other from skim milk. This last may in the future prove of great importance in the utilisation of surplus skim milk. " Saya " unlike skim milk remains good for many months if carefully preserved. Further the transformation of skim milk into this product does not require elaborate and costly machinery.

" Acidophilus " Milk. — This is a comparatively recent product, which is prepared on a large scale in America. As an active organism it contains *Lactobacillus acidophilus* (better named *Bacterium acidophilum*) which is isolated from the faeces of sucklings. This is rod-shaped, strictly gram-positive, measuring 1.5 to 2 microns in length and 0.6 to 0.9 microns in width. The essential difference between the *Bacterium acidophilum* and the *B. bulgaricum* lies in the fact, that the former alone is capable of fermenting one of the sugars, maltose, and of establishing itself within the intestine itself. This factor is of high importance for the therapeutic value of

products based on lactic acid. *Bacterium acidophilum* is actually on the market under the form of cultures in milk, agar, etc. Through tests, it has been ascertained that "acidophilus" milk changes the gram-negative flora of the intestine into gram-positive.

All research on acidophilous milk has proved the value of the acidity of this flora within the human organism; it is for this reason that the therapeutical value of the products offered for sale increases in proportion to their content in micro-organisms.

It has been shown that carbonic anhydride is necessary for the development of bacteria. Some of these flourish in the presence of an atmosphere of CO_2 of ordinary concentration whereas others only develop in a medium having a concentration of 1 to 10 % of CO_2 ; among the latter is the *Bacterium acidophilum*. To prepare "acidophilus" milk, milk bacteriologically as pure as possible must serve as the basis, whether whole, or skimmed fully, or partially. In order to prepare pure cultures, use should be made of milk which has been sterilised for 30 minutes in an autoclave under a 20 lb. pressure, until the purity of the culture has been assured. Generally 1 to 2 litre bottles are used, cooled, after sterilisation, to $99^{\circ}.5$ F ($37^{\circ}.4$ C). The milk is then seeded with 2.5 % of a culture recently prepared and maintained at $37^{\circ}.4$ C for 12-18 hours, until a light layer of serum appears on the surface of the precipitate. In preparing quantities for the market, the milk should be as pure as possible and bacteria free, and is accordingly treated either by the intermittent pasteurisation process, or under pressure so as to destroy the microorganisms present. Experiments have shown that heating under pressure is the more practical method, and at present this is the one chiefly in use.

The milk is heated for half an hour under a pressure of from 12 to 15 lbs. at a temperature of $245-250^{\circ}$ F ($118^{\circ}.3-121^{\circ}.1$ C). Then it is cooled to the incubation temperature. The milk is lightly caramelized during the sterilisation and so adopts a characteristic colour and odour. After cooling to 90° F ($32^{\circ}.2$ C), it is seeded with 1.4 % of pure culture (generally about 2 %) and maintained at that temperature for 18-20 hours, until a small quantity of serum appears on the surface of the crust. At this moment the product has generally an acidity of 1 to 1.5 % expressed in lactic acid, and should contain 300 to 400 million micro-organisms per cm^3 . The length of the incubation period is of vital importance in relation to the number of organisms to be found in the product at the moment of sale or consumption. It can only be determined by experience. The formation of too much serum should be avoided during the cooling period; this requires great practice, because the milk should not be cooled to too low a temperature.

"Acidophilus" milk should be sold as quickly as possible and its preparation should be regulated so that the product is ready for sale at the end of the incubation period.

It is found only in the most populous towns of America where the consumption is very high, and the manufacturer is assured of securing a return for the very high costs of production.

* * *

The above account shows the great importance of these different products in food economy and food hygiene. The utilisation of the skim milk resulting from buttermaking is a matter of interest, since in this way the product is of some value and sells in large quantities. The products at present on the market are prepared according to strict scientific principles and are much appreciated on account of their high nutritive and therapeutic value.

E. GASSER.

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BOOK REVIEW (I)

Meteorology.

KENDREW W. G., *Climate, A Treatise on the Principles of Weather and Climate*, 329 pp., 112 fig., 12 plates. Clarendon Press, Oxford 1930. Price: 15 shillings.

[This book aims at presenting, in simple form, the fundamentals of atmospheric phenomena, and is one of the best published on the subject in recent years.

It is divided into ten sections on the following subjects: (1) Introduction — (2) Insolation and Temperature — (3) Atmospheric Pressure and Winds — (4) Humidity, Rain, Evaporation, Clouds and Storms — (5) Solar Radiation and Nebulosity — (6) Fogs — (7) Climatic conditions of mountains and high lands — (8) Weather in temperate regions — (9) Local Winds — (10) Special Climatic Conditions.

The illustrations, comprising 112 figures, and 12 plates mostly reproduced from excellent photographs, are careful and accurate].

(1) Under this heading short synopses are given of books sent for review.

KNOCH Karl, *Klima und Klimaschwankungen* (Sammlung "Wissenschaft und Bildung", Nr. 269), 151 p. Leipzig 1930, Verlag Quelle J. Meyer. Preis: RM 1,80.

[This little treatise on Climate and its Variations consists of seven Chapters: (1) Climatology and its Methods — (2) Climatic Conditions — (3) Climatic types — (4) Attempted Classification of Climates — (5) Climatology of the different parts of the Earth — (6) Variation and Changes of Climate — (7) Climate and Man.

This work is distinguished from others in the same field by the importance it gives to variations in climate and the influence of the latter on man. To summarise, it deals with: Climatic variations in the geological and prehistoric past — progressive changes in climate in historic times — variations of atmospheric pressure lasting three or four years — climatic periods of eleven, sixteen and thirty-five years.

The Chapter "Climatology of various parts of the World" (pages 60-103) deserves careful attention, as it emphasises the special characteristics of these different climates].

GRADMANN Robert, *Süddeutschland* (Bibliothek länderkundlichen Handbücher), 2 Bände, 215 + 354 p., 49 Textbilder, 43 Karten and Tafeln. Stuttgart 1931, Verlag von J. Engelhorn's Nachfolger. Preis: RM 40.

[This 2 vol. geographical description of Southern Germany, is the first publication on the Reich to appear in the Library of Geographical Manuals edited by Prof. Albrecht PENCK. This work is very accurate from a scientific standpoint. It devotes considerable space to research in morphology, geology, biology, and particularly meteorology. It contains a mass of data on local climates, which will certainly be of interest to meteorologists, and in addition, is a mine of valuable information in its presentation of geographical facts.

Vol. I (General Introduction) contains a single Chapter of fifteen pages only on Climatology. This, however, clearly illustrates the frequent and rapid changes of climate between one region and another in Southern Germany. Vol. II, on the other hand, (The Various Regions) gives a special description of the climate of each region dealt with. The author has avoided conventional or routine treatment of his subject, and lays emphasis, at one time on the soil, at another on irrigation or vegetation, according to the geographical conditions. The fact that the author is personally acquainted with the regions about which he is writing has made his task easier, and his description of the climatic conditions more significant and interesting.

The text is well illustrated by numerous maps and photographic views].

Soil Science.

KEEN B. A., *The Physical Properties of the Soil* (The Rothamsted Monographs on Agricultural Science), 380 pp., illustrations and diagrams. Longmans, Green and Co., London-New York-Toronto, 1931. Price: 8 dollars.

[This is the fifth volume of the "Monographs on Agricultural Science" published by the Rothamsted Agricultural Experiment Station. Its appearance has been eagerly awaited by pedologists interested in the physical composition of the soil, ever since its preparation was announced some years ago. During the last thirty years there has been much research in this field, but this work is the only one published in English on this branch of pedology, since that of WARRINGTON in 1900. The author is a master of his subject, which he has studied with marked ability ever since he began working as soil physicist at the Rothamsted station.

There are ten chapters headed as follows: (I) Historical Introduction — (II) Mechanical Analysis — (III) Distribution and Movement of Water in the Soil — (IV) Soil Properties at Low Moisture Content — (V) Soil and Clay Pastes and their behaviour — (VI) Properties of Soil and Clay Suspensions — (VII) Soil Constants and Equilibrium Points — (VIII) Physical properties of Soil under Field Conditions: Cultivation and Cultivation Implements — (IX) Soil Temperature — (X) The Soil Atmosphere.

Chapter II: Mechanical Analysis, is an excellent introduction to the study of this subject. The author here discusses clearly and logically, all the ordinary methods for grading soil particles according to size. He describes the automatic self-recording balance of KEEN and ODÉN, pointing out that we have not yet discovered a way of avoiding errors due to currents caused by changes in density of the liquid under a pan of this balance. Unfortunately, the author omits to mention the recent developments in the use of the centrifuge, which sifts such particles of earth as are too fine to be separated within a reasonable space of time, by sedimentation.

The author goes deeply into the relation between the soil and humidity, a subject in which he is particularly interested.

The bibliography of 263 titles, which appears at the end of this work, shows that the available literature on the subject has been carefully studied].

Limnology.

NAUMANN Dr. Einar, *Limnologische Terminologie*, 776 p., 158 Illustrationen. Verlag Urban und Schwarzenberg, Berlin-Wien 1931.

[The author gives, in alphabetical order, a brief and precise definition of the terms in use in limnology. During the last few years, this study has been developed and extended to embrace the problems of almost every branch of natural science involving a multitude of technical terms and therefore this glossary gives the book an added value. It includes, in addition to terms of international use, words peculiar to the German language, and the author hopes that it may serve as a basis for a dictionary of international terminology, covering all the principal languages].

N. v. G.

Genetics.

DIX, W., *Praktische Pflanzenzucht auf theoretischer Grundlage*, 251 p., 15 Fig., 4 Tafeln. Verlag J. Neumann, Neudamm 1931.

[This treatise on practical plant selection, based on theoretical principles, is written primarily for the practical worker, and this fact gives it its peculiar value. In his numerous practical examples and the valuable hints which he gives, the author follows the work on Selection of Messrs. F. HEINE of Hadmersleben.

After describing in detail the processes for the improvement of plants by simple selection, the author sets forth clearly the principles on which the practical operations of selection are based, and pays special attention to the question of variability.

Another Chapter deals with the creation of new varieties with special reference to crossing. Here also a presentation of the theoretical principles follows the description of the practical processes and an outline is given of the modern science of heredity.

The last Chapter, Comparative examination of the selected strains, has a practical importance of the first order].

N. v. G.

FORESTRY

Notes.

INTERNATIONAL REGULATION OF TIMBER EXPORTS — Representatives of the chief institutions concerned with the timber industry in Finland, Estonia, Latvia, Norway, Poland, Sweden and the Soviet Republic, held at Warsaw, at the end of June 1931, a conference for an exchange of views, at the invitation of the Baltic-Scandinavian Chamber of Commerce of that city, this being the first meeting of this kind of the representatives of the timber industry of the countries mentioned.

COUNT OSTROWSKI, President of the General Council of the Polish Timber Association, was appointed President of the Conference, which was especially intended for purposes of mutual information, and after a full discussion, the following resolution was passed:—

"The principal factor in the present crisis in the timber market as also in other branches of economic life is to be found in the disparity between supply and demand on the world market. The crisis has been increased by a feeling of uncertainty, that is to say, it has not been possible, on the basis of really adequate statistics, to determine in advance the position on the different markets and within fixed periods, so as to organise export policy in accordance with these data. The isolated efforts so far accomplished by the exporting countries have not led to appreciable results on account of the want of uniformity in the means employed. The only way of arriving at a reduction or prevention of future international crises will be joint international action on the part of the exporting countries. This policy should include a stabilisation of the position of the timber market, without however prejudicing the interests of importing States and of the individual importers, nor those of the consumers of timber, but in any case it should include a systematic scheme of operations on the part of the exporting States.

"The timber exporting States not represented at the Conference will be invited

to associate themselves with this policy. Comprehensive and uniform timber statistics on a joint basis should be instituted".

Finally the Conference declared that a realisation of the above plans was quite possible and invited those who took part in the Conference to submit the results of the discussions to their organisations.

From the resolutions adopted it appears that a certain international regulation of the timber export trade is considered to be practicable (*Skogen*, Stockholm 1931, No. 14).

R. W.

"A FREE HAND IN FOREST THINNING" BY C. R. HECK. — During recent years progress in forest management has been specially characterised by the increased attention given to the question of the influence of light in varying degrees on the development of forest stands. HECK's Manual on Free Forest Thinning recently published at Stuttgart (1) gives a very interesting and illuminating account of the radical changes which have taken place, especially in Germany, in current tendencies in forestry from this point of view.

This work, which may be regarded as the finished result of a lifetime's researches, experiments and observations in connection with forest management, frankly declares war against the older view that no interference in the shape of thinning is ever permissible in the main forest stand and is completely opposed to the rules formerly laid down by G. L. HARTIG.

The leading principle in HECK's theory is that every effort should be made to produce in the stands a sufficient number of trees without branches, straight limbed, healthy and of fine quality, because, as he constantly declares "the better the shape of the tree, the stronger its growth".

The term "free thinning" (*freie Durchforstung*) implies that all forms of human intervention which serve for the production of well formed trunks should be considered as admissible.

The objects however of HECK's principle will not be accomplished, unless every effort is made to recognise the best formed stems while the trees are quite young, so that suitable treatment may be begun in good time. Lopping should be carried out when the maximum girth of the boughs to be cut does not exceed from 5 to 7 centimetres. All trees, of which the presence is likely to be prejudicial to the growth of the trunks and crown of the permanent elements, should be removed in good time, care being exercised however not to leave any considerable gaps in the leaf canopy and to see that the trunks that are left standing, are properly spaced. At all ages fellings and any other forms of intervention must be carried out with the idea, on which the writer lays constant stress, of "free passage for the strongest". In the struggle for existence, the hereditary aptitude of individual trees is a much more important factor in growth than the results of environment and of working plans. It is precisely for this reason that every encouragement should be given to the vigorous specimens which are bound to survive, so that they may produce fine trunks and crowns, developing qualitatively rather than quantitatively, and thus realise the idea of the "fine forest" which is the true object of the HECK method. The writer has supplemented the crown categories of KRAFT by the addition of seven trunk classes in order to facilitate the constant control of the stronger elements.

In addition he calls attention to the marked difference between free thinning and upper storey thinning, in which the main feature is that the second method, even with its E. degree which is its most important feature, does not begin to give special encouragement to the permanent forest elements till a very late stage and is thus less effective than free thinning.

The writer brings to the support of his theory the results of his lifelong work of research which is described in his book. He draws a comparison between forest stands regulated for the past 30 years in accordance with free thinning principles and those of similar soils in the neighbourhood managed in accordance with the older methods. He describes the marked differences to be observed as to the number and development of the trees, the advantage being all on the side of free thinning. His experiments and observations deal with the following species, beech, ash, cork oak, spruce and pine, as also with mixed stands of larch, Scots pine and spruce. Regarding the oak he calls attention to the marked difference between the value of the trunks when stripped of branches and of trunks with many branches and knots and shows that fine stems can only be obtained

(1) *Handbuch der freien Durchforstung mit Beiträgen zum Forstlichen Versuchswesen*, Stuttgart 1931, E. Schweizerbart'sche Verlagsbuchhandlung, Ervin Nägele G.m.b.H.

by clearings carried out at as early a stage as possible in young stands. In the case of the ash, having regard to the arrangement of the buds, forked branches should not be allowed and in dealing with Scots pine, the soil and origin of the seeds must always receive attention. Spruce and pine have from the first finer trunks than the other species and it is only necessary occasionally to lop the branches developed in young and not closely growing stands.

Although foresters were interested in the production of fine trunks before the days of HECK, to him is due all the credit for having been the first to recognise the true importance of securing well formed trunks and their superior value. As against the views of the older school, he maintains the theory that not only all kinds of trees have their special characteristics but also that all age classes and even all individual trees present particular features which should always be borne in mind, when drawing up forest management schemes and regulations for cultivation methods. At the same time he is the first advocate of the tendency to give a more important place, as regards the question of thinnings, to true silvicultural rather than to quantitative considerations, and is responsible for the present day general tendency to pay closer regard to quality than to numbers. G. L.

FOREST RESOURCES OF LATIN AMERICA. — The forested regions of Latin America cover, according to Mr. W. R. BARBOUR (*Pan-American Magazine*, Washington, D. C., 1930, No. 4) well over three millions of square miles (an area larger than continental United States exclusive of Alaska), and contain at least six thousand billion board feet of standing timber. The annual rate of growth in the tropics is much higher than in temperate zones. Under proper silvicultural management the forests of Latin America could produce annually some six hundred billion board feet, an amount over twice as great as the present annual cut from the forests of the United States.

Up to the present time, Latin America has done little along the lines of progressive forestry. In several of these countries in spite of the immense forest resources they possess, there is the menace of a timber famine, due to the indiscriminate fellings that have gone on. Even firewood in some parts has become scarce, and the bulk of the construction timber required is imported from the States, since inadequate transportation facilities and a scarcity of labour have made it easier for many coastal regions to import their timber than to draw it from their own hinterland.

Several regions in Tropical America; notably Porto Rico, Haiti, and the British Colonies (Trinidad, British Guiana, and British Honduras), have for a number of years maintained active Departments of Forestry, which are conserving existing forests and doing extensive replanting. More recently Brazil has initiated an ambitious forest programme, which has already been described in this Review (1), and certain other countries of Latin America have made a beginning. R. W.

REAFFORESTATION IN NEW ZEALAND. — According to Mr. Alec R. ENTRICAN (*American Forests and Forest Life*, Washington D. C. 1930, No. 9) this country has undertaken afforestation operations on a larger scale than any other country in the world, excepting Japan. Its present rate of planting exceeds 75,000 acres a year. "A forest conscience" has been awakened, and there has been an application of mass production methods to tree nursery practice. Reduced costs of tree planting and active participation of commercial interests in forestation work are among the results.

The forest policy of New Zealand over many years was the "cut, hack and burn" policy, and in less than 80 years about 77 per cent. of the virgin forests on an area of over 40 millions of acres had been cleared. The result was that prices of timber became extremely high and went on increasing rapidly.

To remedy the situation, the Dominion Government instituted after the war the State Forest Service, the primary object of which was to secure the economical use of all forest land whether forested or not, and thereby to ensure to the country a perpetual supply of wood products, while at the same time preventing soil erosion and regulating stream flow.

The Dominion is divided into seven forest conservation regions, each being in charge of a conservator of forests who is responsible for timber sales, fire protection and reafforestation work. Separate branches deal with silvicultural research and experiment stations and with forest products research.

(1) See: A. BRUTTINI, Protection of the Forest Wealth of Brazil, *International Review of Agriculture*, Rome 1929, No. 3, p. 128 and No. 6, p. 253.

With the exception of a few species, the same timber trees are found generally throughout the islands constituting New Zealand and form forests with subtropical characteristics. The softwood species of primary commercial importance are: "Rimu" or Red Pine (*Dacrydium cupressinum*), White Pine (*Podocarpus dacrydioides*), "Matai" (*Podocarpus spicatus*), "Kauri" (*Agathis australis*) and "Totara" (*Podocarpus Totara*). The commercial hardwoods are: Beech (*Nothofagus Menziesii*, *Nothofagus fusca* and *Nothofagus truncata*) and Tawa (*Beilschmiedia tawa*). The Forest Service deals at the present time with over seven and a half millions of acres of State forests, or 60 per cent of the forested land.

A survey of the timber resources of the forests showed that only twelve million acres or 18 per cent of the total land area of New Zealand remained under forest, and that of this area only six million acres carried merchantable forests. The annual net increment was only 11.3 cubic feet per acre.

The total annual increment (taking the hard and soft woods together) was 69 million cubic feet, whereas the total wood requirements of the country approximated to some 82 million cubic feet.

To meet the problem of establishing within 50 years a forest capital which would at least meet the country's domestic timber requirements, rapidly growing softwoods were introduced, notably from the Pacific coasts of North America, and in particular, *Pinus radiata*, *Pinus ponderosa*, *P. Laricio*, *Pseudotsuga taxifolia*, *Cupressus Lawsoniana*. The average annual increment of these introduced species is estimated by the Forest Service to be about 250 cubic feet per acre, a remarkably high figure showing the very rapid growth of these trees in New Zealand.

The forestation was begun in 1921, and by the end of the 1929 planting season it was estimated that the State Forest Service plantations would total 250,000 acres. The total area planted by the local authorities of villages or towns probably approaches 20,000 acres.

As regards forestation carried out with private capital, two kinds of organisations have been formed for the purpose: the first is the joint stock company, in which each shareholder receives a share of the profits according to the amount of capital invested, while the property in the forests is vested in the company. The second type is a private company with a comparatively small capital; the contributors do not however become shareholders, but receive after a given time a certain area of land duly planted according to a prescribed agreement. The interests of the investors are watched over by trustees appointed by themselves, and the lands concerned are conveyed by means of mortgage to the trustees until the time comes for conveyance to the investor.

Out of 16 companies engaged in forestation operations, six only in 1928 belonged to the second category; but although less numerous they carry out the greater part of the afforestation: one company alone, for instance, reported that it had already planted an area of 106,202 acres.

R. W.

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MONTHLY BULLETIN

OF

AGRICULTURAL SCIENCE AND PRACTICE

GENERAL AGRONOMY AND CROPS OF TEMPERATE REGIONS

Notes.

GENERAL AGRONOMY.

Meteorology.

THE DISTRIBUTION OF OZONE IN THE ATMOSPHERE — CHALONGE and DUBOIS have carried out experiments to verify the hypothesis that ozone is confined to a comparatively thin layer in the upper strata of the atmosphere. The ordinary method of determining the altitude of the ozone by direct solar radiation was replaced by a method utilising diffused light. The measurements were made in the afternoon of 7 October 1930 at the Observatory of the Pic du Midi (Pyrenees) in excellent atmospheric conditions. The thickness of ozone remained constant during the measurements and showed no variation at sunset. Its value as determined by photographs of the lunar spectrum on 8 October between 12 and 5.0 am. was exactly the same as on the previous day.

According to these observations the distribution of atmospheric ozone is more complicated and less discontinuous than had been supposed and considerable quantities of the gas occur down to relatively low altitudes. (*Comptes rendus de l'Académie des Sciences*, Paris 1931, tome 192, n° 13, pp. 808-810).

A CURIOUS METEOROLOGICAL PHENOMENON. — Under this title M. H. DOUVILLE describes in the *Comptes rendus de l'Académie des Sciences* (Paris 1931, tome 193, n° 9) a thunderbolt observed in Paris on the afternoon of 24 August 1931 during a violent storm accompanied by heavy rain.

On entering his house the writer saw the courtyard littered with plaster débris. He was told that a chimney had just been struck by lightning. He found that the corners of a chimney stack had been torn away and that the zinc covering was melted, but no damage had been caused either to the interior of the nearest chimney nor in the apartments through which it passed down to the ground floor. It was not an ordinary lightning shock however; it was observed by chance from close at hand.

On the 4th floor a servant was sitting by a window overlooking the courtyard; a bright light made him look up and he saw in the sky a ball of red fire, apparently about 30 metres in diameter, falling obliquely above the courtyard in a NE direction. At a distance of a dozen metres the observer saw the ball strike the corner of a chimney stack above the roof and then burst 'like a 75 cm. shell', throwing out a rain of fire; at the same moment he was thrown backwards by a strong blast of air.

The bright light and the noise of the explosion were noticed by the concierge and the tenants who saw the plaster fall and smelt an odour of sulphur; certain persons in the vicinity felt a sort of vibration.

No foreign body was found in the courtyard and it seems that it was a case of a 'fire ball'; no electric action was observed however. The small amount of damage shows in any case that the meteoric mass must have been extremely small.

T. B.

Soil Science.

SOIL TYPES OF BRAZIL AND URUGUAY. — An interesting study of these soils is described by KVACHIN-SAMARIN in *Der Tropenpflanzer*, numbers 9 and 10, 1930.

Brazil. — The soils of Brazil are divided by the writer into 3 zones:—

- (1) Tropical and subtropical forest zone, up to 600 m. in altitude.
- (2) Forest steppe zone, from 600 to 1000 m.
- (3) Mountain steppe zone, from 1000 to 2500 m.

In the first two zones the system of *red soils* predominates, the varieties of which are of the following shades:— dark red, red ('terra vermelha'), laterite colour, violet, cocoa colour ('terra roxa'), ochre, yellowish red.

The 'terra roxa' retains its typical chemical and physical properties only while it is under forest; it then contains up to 12 % of organic matter. When brought into cultivation the content in humus is reduced to about 1 % in 5 years. At the same time the soil becomes lighter in colour and changes to the ordinary red soil ('terra vermelha'); it loses alkalis, lime and phosphoric acid by leaching and is greatly impoverished in nitrogen because the decrease in organic matter reduces the activity of the nitrogen-fixing bacteria. Thus this soil which is particularly rich in the first place after a few years of cultivation requires fertilisers.

The 'terra vermelha' contains less organic matter than the preceding type: from 1 to 6 % only. It is also less rich in phosphoric acid, in nitrogen and in lime. The reaction is slightly acid or neutral, occasionally weakly alkaline.

In the 3rd zone, mountain steppe, the soils are more or less stony, in colour light red, light grey and yellowish red.

In the low lying moist parts of Brazil there are peaty soils in addition to silts.

The great diversity of the soils and the complicated processes of their formation make it desirable that a careful agro-geological survey should be made; such a survey would be greatly facilitated by the geological studies already in hand and the results should make it possible to draw up a soil map which would be invaluable in land settlement and the development of cultivation.

All subtropical crops succeed well in the extensive zone of the forest steppe, but for the development of grain growing experiments in planting methods are required because broadcast and row sowing are both unsuitable; a new method of machine planting should be attempted.

Uruguay. — Apart from certain sandy regions the soils of Uruguay are for the most part rich in fine and colloidal elements.

The 'tierra negra de estepa' (black steppe soil), called by GLINKA 'tchernosiom' differs from the true Russian chernozem in the following particulars:—

- (1) Thickness not exceeding 30 cm., whereas the Ukrainian chernozem exceeds 100 cm.;
- (2) Lighter colour, corresponding to a content in humus half that of chernozem — 5 to 7.5 % against 10 to 15 % of chernozem;
- (3) No effervescence with HCl except when the soil contains fragments of limestone. This black soil must be regarded as a special zonal type which is formed in given climatic conditions:— 1000 mm. of rainfall annually and a mean annual temperature of 16°C.

Uruguay soils are very poor in lime, poor in phosphoric acid, but generally well provided with nitrogen and potash. It is therefore necessary to supply them with P_2O_5 and $CaCO_3$ to encourage grain growing, particularly that of wheat which is still little developed in comparison with maize.

The writer considers that to develop grain growing more attention should be paid to the agro-geological studies already carried out by Professor K. WÄTHER and soil maps should be prepared of the different departments. Soil maps he considers essential for a rational land settlement.

THE ROLE OF SOIL PROTOZOA. — In 1909 RUSSELL and HUTCHINSON published their theory that protozoa destroy soil bacteria, so that the recognised beneficial effects of soil sterilisation would be due to the destruction of a great part of the protozoa and the consequent free development of bacteria.

With a view to testing the accuracy of this theory KOFFMAN has carried out a series of very interesting experiments in the Bacteriological Section of the Central Agricultural Experiment Institute of Stockholm. He used a good soil from a garden of an Agricultural Experiment Station near Stockholm which has been under cultivation a long time. The principal results were the following.

I. By a special direct method of investigation invented by himself he was able to determine the real numbers of protozoa, bacteria and other microorganisms present in the soil and their relative proportions. It was found that the microfauna of the soil

studied was composed mainly of small flagellates of a size differing little from that of *Azetobacter*; the large flagellates and rhizopods were much less numerous; ciliates were only exceptionally present.

In soils of normal humidity the total number of protozoa varied according to the physiological conditions of the soil; when conditions were favourable there might be 50,000 individuals per gram of soil.

The soil microflora, including bacteria, algae and fungi, was represented by an enormous number of species and individuals. The soil studied contained also cysts and resistant spores of protozoa and algae.

Using an indirect method of investigation, consisting of soil inoculations of various nutritive media, large forms of protozoa were obtained which did not appear with the direct method. It was thus concluded that the indirect method gives a false idea of the soil microflora and fauna and particularly of the part played by protozoa, for it is obvious that the large protozoa may have more influence on bacteria numbers than the small protozoa.

II. Soil metabolism was also studied in differing physiological conditions and with various contents in protozoa, in order to determine better the rôle of protozoa in microbiological processes. Series of soil samples were partially sterilised with heat or chemicals; other series were given increased quantities of protozoa by the addition of hay infusions inoculated with soil.

It was found that bacteria were in excess of protozoa not only in numbers but also in volume, so that the latter could scarcely hinder the microbiological processes of the soil. This fact was confirmed by the research on soil metabolism. A study of nitrification and ammonification made directly in the soil without the aid of artificial nutrient media showed that variations in protozoa numbers had scarcely any effect, whilst changes in the physiological conditions greatly influenced both processes.

III. In order to determine the rôle of protozoa in connection with soil fertility growth experiments were carried out with oats in 4 series — (1) fresh soil, control — (2) fresh soil with protozoa added — (3) sterilised soil, control — (4) sterilised soil with protozoa added.

The yield of the oats was higher on the sterilised than on the fresh soil, but the addition of protozoa made no difference to the yield of either. Thus it would appear that the increased fertility produced by partial sterilisation of the soil is not due to destruction of the protozoa, but to other factors.

From these important results the following conclusions are drawn:—

(1) In normal soils there are protozoa but they constitute only an insignificant part of the population in number, species and volume, so that it seems they are not able to affect to any appreciable extent the numbers of bacteria and other micro-organisms. The high numbers of protozoa that are said to have been found in soils of normal humidity are due to the use of indirect methods of experimentation which allow of the development of cysts of aquatic protozoa which do not belong to the active micro-population of the soil.

(2) The soil metabolism studies confirmed the opinion that the soil microfauna exerts an insignificant influence on the microbiological processes of the soil.

(3) The growth experiments showed that the increased fertility of partially sterilised soil is not due to the destruction of the protozoa, but to other factors.

(4) It may however happen that in soils in abnormal conditions (waterlogged or irrigated with large quantities of sewage water) and also by using artificial nutritive media, results are obtained tending to show that protozoa interfere with the development of bacteria and are thus of fundamental importance in soil metabolism. In theory and in practice however this fact is of only secondary importance in the study of problems concerning the genuine soil protozoa and the fertility of normal soil (*Meddelande Nr. 391 från Centralanstalten för försöksväsendet på jordbruksområdet, Bakteriologiska avdelningen Nr. 55*) (Communication No. 391 of the Central Agricultural Experiment Institute, No. 55 of the Bacteriological Section).

T. B.

Soil Improvement.

YUGOSLAVIAN EXPORTS OF CHEMICAL FERTILISERS. — According to a report issued by the United States commercial attaché in Yugoslavia increasing quantities of chemical fertilisers are exported, the value having increased from L. 228,800 sterling in 1926 to L. 508,200 in 1928.

The exports are mainly calcium cyanamide and superphosphates. The total output of the 4 factories producing the latter is about 160,000 tons.

The home consumption of chemical fertilisers is however little developed, scarcely exceeding 40,000 tons, 34,000 tons of which are superphosphates. The Ministry of Agriculture and the agricultural co-operative societies are actively endeavouring to increase the consumption.

THE SAFE USE OF INDUSTRIAL NITRATES OF LIME — M. Camille MATIGNON has made two communications to the Academy of Science of Paris (*Comptes rendus* 1931 tome 192, p. 777 and tome 193, p. 329) on this subject. He states that the nitrates of lime now manufactured on a large scale may be transported and stored without risk. They may be heated without inconvenience even when mixed with combustible materials, which distinguishes them clearly from nitrate of ammonia.

These conclusions have been confirmed recently in an outbreak of fire at Oslo (Norway) which consumed a large wooden warehouse containing forage and 700 bags (of 100 kilos) of ammoniacal nitrate of lime (15.5 % nitrogen) distributed in 3 lots. In consequence of the fall of burning beams and timber one of these lots was in direct contact with burning matter; the two others were exposed to only radiated heat and the upper sacks enveloping the nitrate were charred and destroyed. In the 1st lot the combustion of the nitrate on the top developed no particular activity and the extinguishing of the fire at this place was not more difficult.

These observations are valuable because it has been thought that the industrial nitrates of lime are capable of spontaneous ignition, and for this reason certain transport companies have even imposed extra charges. This fear however is unfounded; the extra charges have been abolished and these fertilisers have been restored to the ordinary dues. Nitrate of lime may be truly dangerous only if it is mixed with combustible matter for the endothermicity of its decomposition plays a rôle similar to the heat of vaporisation of water, so that it acts as an extinguisher when the combustion remains on the surface.

It may thus be concluded that the nitrates of lime (Norwegian up to 14 % and ammoniacal 15.5 % of nitrogen) are not inflammable products. Moreover they cannot cause spontaneous combustion by contact of the sacks or barrels that contain them even when they are exposed to the highest temperatures in tropical regions or in ships' holds or warehouses, for no appreciable reaction of calcium nitrate on organic matter occurs below 300°C.

TRIALS OF MICAS AS POTASH FERTILISER IN NORWAY. — According to the *Norsk Landmannsblat* experiments with micas which have been carried out for some years at the Agricultural College of Aas near Oslo, have given very encouraging results. In certain of the trials the potash of the finely ground micas, biotite and phlogopite, had a fertilising effect equivalent to an equal quantity of potash of 40 % Stassfurt salts, specially in peaty soils. On an average however it is admitted that 1 kg. of mica potash is equivalent to only 0.5 kg. of Stassfurt salts potash and that the micas have a rather slow action, though their action is more lasting than that of the soluble potash salts.

These experiments had in view the utilisation of the Norwegian resources of potash rich micas, particularly the abundant phlogopite deposits of Odegårdens in Telemark.

FERTILISING VALUE OF TOBACCO STEMS. — In south-west France the tobacco crop is not picked leaf by leaf, but the plants are cut level with the ground; they are left to wither a little on the field and then hung up in the drying sheds. After about 6 weeks the leaves are stripped off.

The stems are used as they are as a manure in vineyards and on grassland. On the latter their fertilising action is rapidly shown by increased growth and a beautiful green colour of the grass. This effect is more marked when the stems are used as a mulch than when they are dug in.

To determine what are the elements of the stems to which the fertilising effect is due E. GIRAUD had them analysed by the Central Bureau of Fertiliser Research at Mülhouse. Analyses were taken of the fresh stems and of the ligneous residue left on the fields after the decomposition of the organic matter of the stems. The results, as percentages of the stems dried at laboratory temperature, were as follows:—

		Total nitrogen	Total phosphoric acid	Total potash
(1) Fresh stems	Sample No 1	2.00 %	0.37 %	3.95 %
	Sample No 2	2.60 »	0.41 »	3.45 »
(2) Stems decomposed on the field		0.75 »	0.20 »	0.30 »

These results show that the fresh stems are characterised by high contents in potash and nitrogen, in contrast with their low phosphoric acid content. The stems decomposed on the field are on the contrary almost devoid of potash (90 % of which has passed into the soil) and have lost about 2/3 of their nitrogen; they have lost only half their phosphoric acid.

The remarkable fertilising property of the tobacco stems are thus due mainly to their potash and in a lesser degree to their nitrogen. The grass of the meadows mulched with the stems have in fact the soft green colour characteristic of the action of potash fertilisers rather than the dark green associated with nitrogenous fertilisers. It is not surprising that the potash of the stems is rapid in its action because it is present in a readily soluble form. (*La Potasse*, Mulhouse 1931, No. 44, pp. 122-124).

T. B.

TROPICAL AND SUBTROPICAL AGRICULTURE

A review of the most important publications on coffee issued in the second half of 1930 and the first half of 1931 (1).

PRODUCTION.

1. *Brazil*. — The production of Brazil and its share in world production in the last few years is to be seen from the following figures.

Coffee production in bags of 60 kg.

	Brazil	Other countries	Total	Share of Brazil in world- production
1924-25	13,721,000	6,762,000	20,483,000	67 %
1925-26	14,009,000	7,049,000	21,058,000	67 %
1926-27	14,184,000	7,068,000	21,252,000	67 %
1927-28	28,334,000	8,003,000	36,337,000	78 %
1928-29	9,932,000	12,068,000	22,000,000	45 %
1929-30	21,000,000	8,000,000	29,000,000	72 %

On the 30th July 1929 the stock in Brazil amounted to 9,325,000 bags, and the world's visible supply to 5,335,000 bags.

(1) For previous reviews in this series see this *Bulletin*, 1930, No. 2, pp. 55-61; No. 19, pp. 32-36 and No. 11, pp. 411-416.

Of the total export of Brazil the State of São Paulo produces about 71 %.

The number of coffee trees in bearing in 1930 was estimated at 2,326 million ; 1,181 million trees were in São Paulo, 624 million in Minas Geraes, the remaining 521 million in the other States (1).

The increase in production in the last three years is expected to continue in following years because since 1927 many new fields have been planted. This, according to REGRAY (2) was mainly the consequence of the measure taken by the ex-Director of the Coffee Institute in 1927 when he changed the rate of payment of the Coffee Institute to the planter from 20 to 36 milreis. "On the basis of 20 mil reis for ten kilos at Santos the Brazilian planter enjoyed still an excellent situation. At this price, giving a good profit there would have been little planting done".

An idea of the extension of the planted area can be obtained from the statistics which show that in 1926 there were in São Paulo 1,009 million trees in bearing and 240 million young trees, and in 1929-30 1,181 million trees in bearing with approximately 250 million young trees. The trees were considered in 1926 to be divided as follows over the different areas:—

Old zone : 250 million trees with a production of 37 arrobas per 1000 trees ;

Intermediary zone : 500 million trees with a production of 55 arrobas per 1000 trees ;

New zone : 250 million trees with a production of 70 arrobas per 1000 trees. (1 arroba = 14.7 kg.).

It has also been reported (3) that the productivity of the trees has increased, owing to more careful cultivation.

These figures lead to the conclusion that the plantations of São Paulo will increase still further in productive power in coming years.

It is true that the consumption is also on the increase, but only slowly (4,5). Last year (1929-30) was a record year and the consumption reached 23,500,000 bags ; the average consumption for the last three years was 23,115,000 bags and for the last five years 22,475,000 bags.

With a world production of 30 million bags and a consumption of 24 million bags, we have a yearly surplus of 6 million bags. REGRAY expects that the coming years will show average results as follows:—

	Average consumption —	Average production —	Surplus —	Total stock —
1929-30	23.5	38.5	15.0	29.4
1932-33	25.0	30.0	5.0	39.4
1934-35	26.0	30.0	4.0	47.9

The situation would therefore become more and more awkward and unavoidably more disastrous.

The question may be asked whether the fall of coffee prices will not result in a natural limitation of the production by the abandonment of the least productive fields. The solution of this question depends on the retail price. In the declaration made by the Coffee Institute of São Paulo in 1928, the retail prices were established as follows ;

Zone	Average production (per 1000 trees.)	Retail price at Santos (per bag of 60 kg.)
Old zone	37 arrobas	196 milreis
Intermediate zone	55 "	140 "
New zone	70 "	128 "

If these prices were to hold the planters would at present sustain heavy losses, coffee being sold at Santos for 90 milreis (1 milreis = 6*d.*) per bag of 60 kg, and the abandonment of many fields could be expected. But the cost price is really much lower. According to REGRAY, who goes into details about the expenses of the coffee plantations in São Paulo, we may estimate that a well administrated plantation delivers a bag for 36 milreis at the interior railroad station or 51 milreis in Santos and 71 milreis f. o. b. In order to be quite safe and conservative he accepts a maximum average price of \$79 800 f. o. b. The costs of the São Paulo planter may thus be considered low and even low market prices will leave him a certain margin of profit.

Up till 1929 the Brazil Government could keep a favourable situation on the coffee market by the so-called "valorisation", a system of keeping in stock large quantities of coffee in case the demand for coffee was low and bringing on the market the coffee kept in stock as soon as the market became in a better condition. From 1906 to 1929 this system — of which an extensive and interesting exposition was given by BURTON (4) — gave satisfactory results. But against the advantage of a regulation of the supply of the world market the disadvantages of the system have become apparent: the good prices, obtained by an artificial system, have led the Brazilian planter to a certain carelessness in the treatment of his coffee and a certain indifference to the quality of his product. They have besides stimulated the extension of coffee cultivation in Brazil as well as in other coffee growing countries and they have been one of the principal causes of the present overproduction. Another drawback of the system is the high expense which amounts in some cases to 45 % of the cost price.

In consequence of the increased production and the almost stationary demand the stock in the warehouses of the Coffee Institute increased; in December 1929 it amounted to 18,357,000 bags.

In September 1929 the Coffee Institute was no longer able to follow its policy of giving advances to the planter and the dropping of coffee prices which followed caused a serious financial crisis.

Among the measures taken by the Brazilian Government to normalize the situation the resolution of 11 February 1931 may be mentioned here (11); it was settled that all the coffee which was still in stock on 30th June 1931 would be withdrawn from the market and destroyed, that no more coffee of inferior quality would be accepted, and that a tax of 20 % in natura would be levied on all the coffee shipped after 1st July.

On 24th April the Conference of delegates of the different States of Brazil made up a convention (7) in which it was stipulated that a tax of 20 % in natura would no longer be raised on the coffee exported but a tax of 10*s.* per bag of 60 kg.; the amount of this tax would be used to buy coffee from the stocks in order to avoid a surplus and to restore the equilibrium between supply and demand.

An illustrated article on the destruction of coffee in Brazil appeared in *The Tea and Coffee Trade Journal* (49).

Colombia (8). — Colombia ranks second in the list of coffee exporting countries. The exports during the last 5 years were as follows :—

Coffee exports of Colombia (in bags of 60 kilos).

	1926	1927	1928	1929
Exports	2,454,289	2,356,516	2,659,578	2,863,171
Percentage of world production	12 %	7 %	12 %	9 %

The fall of coffee prices created in 1930 a serious situation. Reports of proposed abandonment of coffee cultivation were heard in parts.

Congo. — In many parts of the Belgian Congo the conditions seem to be favourable for a successful cultivation of robusta-coffee, only in the mountains at high altitude the cultivation of *Coffea Arabica* has more success. The great difficulty, however, is the scarce and scattered population. This causes labour difficulties in the plantations; it is considered by MINY (9), that in general a plantation cannot be larger than 300 to 350 hectares without difficulties in obtaining the necessary food supply for the labourers.

The robusta-zone and the zone where *Coffea Arabica* is cultivated are well defined (10). The robusta is cultivated in the western part of the Eastern province, viz, in the two Uélé districts, the Stanleyville district, the Maniema district and a part of the Kasai district, which last produces the product with very small beans, known as "Sankuru". The arabica is cultivated in the region still more to the eastern boundary.

In the forest different species and varieties have been found, all belonging to the robusta-group.

The Eastern Province is the most important part; from here comes more than 80 % of the total coffee produced in the Congo. A few figures regarding this province are given below.

Coffee Area and production of coffee in the Eastern Province in 1929.

District	Number of trees	Production in tons
Stanleyville	4,347,620	628.5
Uélé-Itimbiri	325,000	15.5
Uélé-Nepoko	657,640	278.0
Kibuli-Ituri	2,024,100	245.0
Kivu	2,526,300	420.0
Maniéma	1,000,000	93.5
14,023,020 coffee trees		1680.5 tons

The quantity of Congo coffee imported into Antwerp increased from 250 kg. in 1894 to 275 tons in 1927, 500 tons in 1928 and 1750 tons in 1929.

The total area in coffee is estimated to amount to 18,000 hectares and the total production in 1931-32 to about 15,000 tons.

The coffee industry is almost exclusively an estate industry ; the native coffee industry is of little importance and its produce is used for local consumption.

Some information about one of the robusta-estates — the Katompa plantation in the Katanga district — was given in a report for the International Congress of Antwerp (11). On this estate 503 hectares have been planted with robusta coffee. The methods of cultivation described are not different from those in other countries, but it is somewhat astonishing to read that the method of using regular shade trees is no longer applied and that for the new fields the system of leaving some forest trees standing for shade is followed. In so many countries this method has been recognised to be undesirable that the reason for its application on new plantations in the Belgian Congo is difficult to understand. About the labour question the anonymous author of this report gives no particulars.

The Arabian coffee is cultivated in the Congo at an altitude of 1,500-2,000 metres along the borders of Lake Kivu, in the volcanic region between the Lakes Edward and Kivu and in the mountains of the Ituri, to the west of Lake Albert (12, 14, 15).

In these regions the climatic conditions differ according to the altitude, at the higher altitudes the rainfall is greater. From the few data collected it seems that at an elevation of 2000 m. the rainfall amounts to about 1,800 mm. The coffee trees are cultivated without shade trees, and it is not to be wondered at that they blossom and give fruit at an early age : after one year and a half they give the first crop, at four years they are in full bearing, but they soon begin to decline and at 7 years they are almost leafless. According to the different authors, it is not yet quite clear to the planters what is the reason of this premature decline. The leaf disease (*Hemileia vastatrix*) is everywhere present, but the opinion of the planters is that this disease is not doing great damage. It has been claimed that a sort of "dieback" disease was the cause, but this seems to be a mistake. There is reason to ask whether indeed disease is the cause of the premature decline and whether the use of suitable shade trees and green manuring plants would not improve the condition of the soil and lengthen the lifetime of the trees. It may be remembered here that in other countries, e. g., in Sumatra and Java the coffee trees, cultivated without shade trees, do not give any appreciable yield after the 5th year, while when cultivated under suitable shade trees the coffee is productive during 20, 30 or even 40 years.

A few particulars about the Arabian coffee planted by the missionaries of Katana (Kivu district) were given by R. F. WATTEYNE (12). Here the coffee, planted in 1917, began to bear in 1919 and in 1925 the trees ceased bearing. The missionary who gave us these details adds :— "In the Kivu it is not necessary to protect the coffee trees against the fierce sun and there is no necessity to plant shade trees in the coffee fields". It may be advisable to test thoroughly the accuracy of this statement.

In spite of the favourable conditions of growth and production of the Arabian coffee in the eastern Congo it may be considered very questionable whether it would be possible to make a coffee estate profitable here. Labour is scarce and each labourer means an expense of 20 Belgian francs per day. Also the transportation of machinery and other materials to these remote districts is very costly (14).

In old days the French colonies (15) held a very satisfactory place as regards

coffee-growing. Some of them, such as Guadeloupe, Martinique, Réunion (formerly Bourbon) had known some glorious years of trade, supplying the world with coffee that was highly esteemed. In 1775, for example, Guadeloupe exported 6,300 tons and in 1789 Martinique 5,000 tons, Réunion or Bourbon following with 3,600 tons. But now coffee growing is no more of any importance in these countries. It has become an industry of some importance in others of the French colonies, viz, in Madagascar, Equatorial Africa, Indo-China and New Caledonia. Madagascar leads: in 1908 it exported 90 tons and by 1927 the exports had increased to 5,032 tons; the principal plantations are to be found on the east coast; coffee species of the robusta group are cultivated here. The same species are grown in French Equatorial Africa, where the coffee plantations are principally located in the district of Gabon, Ogooue, N'Gounie, Kouilou-Niari and Oubangui-Chari. The local consumption in these parts seems to be high; the exports amounted to about 58 tons in 1927. In Indochina the cultivation on a commercial basis is of a comparatively recent date: *Coffea arabica*, *C. liberica*, *C. robusta* and *C. excelsa* cover an area of 6,000 hectares in Annam, 3,000 at Tonquin and 900 in Cochinchina. The territory devoted to coffee is being enlarged each year by concessions in the regions of Kontiem and Derlac, which are receiving the close attention of the colonial government.

Some details about plantation work in Phu-Quy (Annam) were given by CASTAGNOL (16) and by GUILLAIS (17). The wages seem to be here 0\$30 to 0\$40 per day task for a man and 0\$20 to 0\$25 for a woman. Mainly Annamites, who come from the coast regions, are used as labourers on the plantations; the planter can rely on these people for his regular work better than on the Muong people, who are more irregular labourers.

In New Caledonia (18, 21) the coffee industry is stationary; in 1926 793 tons were exported, in 1927 890 tons, in 1928 952 tons and in 1929 739 tons.

Information on the cultural methods was given by RISBEC (18) and the commercial value of the different sorts cultivated was described by JOBIN (21).

Originally two varieties of Arabian coffee (*Coffea arabica*), viz, the "moka" or ordinary Arabian and the "Leroy" or "Bourbon pointu", were cultivated.

In 1910 the leaf disease (*Hemileia vastatrix*) was for the first time found to be present in New Caledonia, but its introduction had probably taken place three or four years earlier. It caused a great decrease of the production. In that same year the first seeds of robusta-coffee were obtained from the Agricultural Department in Buitenzorg and two years later, in 1912, 300 kilograms more were imported. Since then much robusta has been planted and much "arabica" and "Leroy" has been replaced by robusta. The leaf disease, however, has not completely devastated the Arabian coffee and most of the fields contain a mixture of Arabian coffee and robusta-coffee and sometimes even Leroy-coffee is still to be found in the fields, but this variety has suffered very much. Recently a new variety "coffee Herfin" has come into notice; its value is not yet certain. At present the area in coffee amounts to 2,864 hectares, divided over 483 plantations, most of which are small family possessions, only 6 being over 50 hectares, 60 over 10 hectares and most are not larger than a few hectares. Generally the work in the coffee fields is done by the owner and his family; imported Javanese coolies are also used but these form an expensive form of labour, the expenses amounting to about 400 francs per month for one man. As shade tree *Albizia lebbek* is mostly used. The arabica of New Caledonia has an excellent reputation in the market, while the "café pointu" or "Leroy" is a lower quoted coffee; locally however, this "Leroy" coffee

is considered to be a choice coffee and the colonists prefer it for home use to the ordinary arabica.

In the Ivory Coast an extension of coffee culture is not improbable. In 1929 the exports amounted to 425 tons. Of this amount 300 tons were produced by the plantations of the "Société d'Elima". LAPLACE (20) gave some information as to the regions most suitable for coffee cultivation and the measures to be adopted in order to encourage the industry and to improve the cultural methods.

In French Guinea coffee is cultivated in the coast region, in the Fouta-Djallon region and in the forest region, but the industry is still in its infancy. It is estimated that the total production amounts to about 12 tons, but only 1.5 tons were exported in 1928 and 1.4 tons in 1929. The Government encourages the native industry by distributing coffee plants (19).

In the Portuguese Colonies coffee culture is of some importance. Angola is the most important colony as regards coffee-growing. The export amounted in 1926 to 9,343 tons, in 1927 to 10,013 tons and in 1928 to 9,826 tons. We are indebted to DE MELLO GERALDES (22), to JANSSENS (23) and to HIRSCHFELDT (24) for having given us important information about this interesting and little known country.

A great number of coffee species and varieties are growing wild in the virgin forest. According to DE MELLO GERALDES the varieties growing wild in the northern part of Angola (Congo district), belong to the species *Coffea Welwitschii*. Other species to be found in the forest are:— *Coffea melanocarpa*, *Coffea jasminoides* and *Coffea hypoglauca*.

The plantations under European management are mostly situated in the districts Quanza North and Quanza South; but also in the far north, in the Majombe district. Different species of coffee are cultivated, mostly belonging to the *cane-phora* group. In the South, along the railway from Benguela to the interior, and still more to the south, in the Mossamedes district, small plantations of *Coffea arabica* are to be found.

Especially in the regions of Encoge-Uige, Cazengo and Dembos (all in Quanza North district) the number of coffee trees growing wild in the forest is very great and many coffee fields have been made simply by clearing the forest as much as seems necessary and leaving the coffee trees standing. In the regions mentioned the mountains attain a height of 800 to 900 m., the rainfall amounts to some 1,200 mm. The system of exploiting wild coffee trees does not seem to be advisable; much higher yields are obtained from regularly planted trees which are well cared for. Another method, sometimes practised and also inadvisable, is the use of young plants from the forest as planting material. The ordinary nursery system in which seeds of good mother trees are laid out is much more profitable to the planter.

For shade forest trees are sometimes left standing, but the disadvantages of this system seem to be more and more realised. What will be the best shade tree for Angola is not yet settled. JANSSENS recommends *Leucaena glauca*, so much used in Java; according to experiments made in Africa it seems there also in many places quite suitable. Another tree considered recommendable is *Albizia Welwitschii*, native to Angola and known here under its vernacular name "Muanze" or "Bange".

The labour question is not dealt with either by DE MELLO GERALDES nor by JANSSENS, which is to be regretted because rumours are sometimes heard that in Angola the recruiting of labourers is not entirely as it should be.

Only coffee of the robusta-group is exported; the arabica-coffee is consumed

cally. In Lisbonne (25,) the Angola coffee is divided into four types: « Novo Redondo » (or “ Amboin ”), “ Cazengo ”, “ Encoje ” and “ Ambriz ”. The Novo Redondo comes from the Amboin and Seles regions (Quanza South) and it obtains the best prices; the “ Cazengo ”, from the district Quanza North, a coffee with small beans, fetches the lowest prices, “ Encoje ” and “ Ambriz ” come from the Congo district.

In the Cape Verde Archipelago Arabian coffee is cultivated on the islands Santo Antão, São Tiago, Fogo and Brava, at an altitude of about 600 metres. The quality of this coffee is very good. The yields are very irregular and accordingly the exports vary much in different years: from 1910 to 1919 they amounted to an average of 356 tons per year, in 1926 to 29 tons, in 1927 to 65 tons.

Also in San Tomé and Príncipe the Arabian coffee (*Coffea arabica*) is the most cultivated species; it is generally grown at an elevation of 500 to 1450 m. On a few low lying plantations *Coffea liberica* is cultivated. The export was in 1926 337 tons, in 1927 307 tons and in 1928 336 tons.

In Mozambique the coffee tree grows wild in the forest. The following species have been found here: *Coffea Ibo*, *C. stenophylla*, *C. racemosa*, *C. Zanguebariae* and *C. Swynnertonii*. There are only a few regular plantations and most of the coffee exported is gathered by the natives from wild-growing trees. The quantities exported are only small: 3 tons in 1926, 0.5 tons in 1927 and 5 tons in 1928.

Portuguese Timor has a few plantations of Arabian coffee (*Coffea arabica*). Timor coffee is of superior quality; it is considered as a “ fancy article ” and it fetches high prices. Leaf disease (*Hemileia vastatrix*) is a serious enemy and recently some experimental fields have been planted with robusta coffee. The exports were in 1926 1 ton, in 1927 2 tons, in 1928 2 tons.

Some data about the caffeine content, the weight and the size of the different kinds of market coffee from the Portuguese colonies were given by DE MELLO GERALDES (25) and by DUARTE (26).

In Malaya coffee cultivation occupies a position of minor importance. The total area under coffee is now shown as 12,907 acres, which is made up as follows:—Federated Malay States 9,059 acres, Straits Settlements 848 acres, Johore 3,000 acres (27).

In East Africa Kenya is the most important country as regards the growing of Arabian coffee; 84,000 acres are in production; the exports amounted in 1929 to 13,000 tons. In Uganda Arabian coffee is grown only on the slopes of the Elgoon and the Ruwenzori mountains. In Tanganyika Territory we find this crop in the province of Moshi Arushi in the Kilimandjara and Meru mountains; it is exported by the port of Tanga (2000 tons) (28).

In Eritrea (29, 30) the Agricultural Department investigated which regions would be the most suitable for coffee cultivation. Irrigation works have not yet been constructed on a large scale and only those parts where rainfall is abundant could come into consideration. A part of the east slope of the mountain in the regions of Merara, Faghená and Dicsana seemed quite suitable. The altitude is here from 1200 to 1800 m. About 6,000 hectares are available. Experiments seem to indicate that at an age of 4 years a yield of 500 gm. marketable coffee per tree can be obtained, the trees being expected to reach an age of 20 years. The Government has given to indigenous families small pieces of land for a period of 20 years for a yearly rent of 10 lire per hectare. Plantlets of the two varieties of *Coffea arabica*, Moka and Ennari have been put at the disposal of farmers, and technical advice for the planting and upkeep is being given. At present about 400 hectares have been planted in this way. Since 1923 350,000 coffee plants have been distri-

buted. SENNI (29) gave advice for successful cultivation, including recommending preventing soil wash, and planting windbreaks and green manuring plants.

In Surinam (Dutch Guiana) the cultivation of Liberian coffee has made very satisfactory progress. After the devastation of the cacao fields by the Surinam die-back disease many of these fields were replanted with Liberian Coffee. The exports amounted to 3,037 tons in 1927, 2924 tons in 1928 and 2,896 tons in 1929. The industry, however, has been seriously handicapped by the low market prices, which dropped below cost price and brought the plantations into serious financial difficulties. In order to save the coffee industry the Governor proposed to the Representative Council to advance to the plantations a certain amount of money which will enable those plantations which are in a viable state to continue the work. For a quantity of coffee equal to the crop of 1930 the difference between the market price and the cost price would be paid to the plantations; a cost price of 50 cts (10 d.) per kg would be fixed (31, 32).

Another difficulty, with which the Surinam planter has to struggle, is the acidity in taste which is characteristic of much of the Surinam Liberian coffee. The experiments made to surmount this difficulty will be discussed below.

The coffee industry in the Netherlands Indies is more of importance than in the French and Portuguese colonies, in Malacca and in Surinam.

After the decline of the Arabian coffee and of the Liberian coffee in consequence of leaf disease the introduction of robusta coffee was in 1901 the beginning of a revival of the coffee industry. The estate export amounted in 1927 to 64,397 tons, in 1928, to 55,314 tons and in 1929 to 55,280 tons; this estate industry has developed especially in Java, which produces 80 % of the total estate coffee. Next to the estate industry an equally important native coffee industry (33) has developed and this almost exclusively in the so-called Outer Provinces (the islands outside Java); this native industry exported in 1927 56,594 tons, in 1928 70,635 tons, in 1929 58,553, the production being about equal to that of the estate industry.

The old Arabian coffee industry of the natives has remained important in Tapanoeli (Sumatra), West Coast of Sumatra, Bali and Central Celebes; the export amounted in 1928 respectively to 1.7 tons, 1.5, 1.4 and 0.8 tons, and in 1929 to 1.4, 1.7, 1.6 and 1.5 tons. Some Arabian coffee is also cultivated in North Celebes and Timor. All these countries produce a fancy Arabian coffee of high quality.

Of much greater importance is the native robusta-coffee industry which has principally developed in Sumatra and more especially in the residencies Palembang, Benkoelen, and the West Coast of Sumatra (exports in 1928 respectively 27,617 tons, 15,641 and 15,590 tons, in 1929 18,536, 11,525 and 14,900 tons).

The robusta is generally cultivated by the natives without shade trees. Accordingly the lifetime of the coffee trees is short: in the third year the trees give a fair yield, in the fourth year the highest yield is obtained, in the fifth year the yield decreases and in the sixth year the production is no more of importance. Then the fields are abandoned. There is, however, a tendency among the native coffee growers to pay more attention to the shade question and some of them have begun to plant the new fields under shade of dadap (*Erythrina* sp.), lamtoro (*Leucaena glauca*), sengan laut (*Albizia falcata*), surian (*Toona suremi*) and sometimes under fruit trees. The Agricultural Instructor encourages the planting of *Erythrina*, *Leucaena* or *Albizia*, these trees being excellent soil-improvers. The preparation of the native coffee is always done by the dry method: the beans are dried in the sun and hulled by hand, in rice-pounders or in small hulling machines. Generally the native planter does all the work in his coffee field with the help of his family, but some of them use hired labour. In Palembang the robusta fields are situated in the hills

parts far away from the coast (Lintang valley, Pasemah Highlands, Semendo district, Makakau and Kisam districts, and round the Ranau lake) and also in the lower parts near Martapoera, Batoeradja, Lahat, Moeara Enim, etc. In the hilly parts the owner of the coffee fields uses sometimes Palembang people from the coast regions or Javanese immigrants or people from Bantam (West Java); sometimes Chinese labourers are used.

Because the shadeless fields give yields of any importance only during the 3rd, 4th and 5th year, the coffee planter has to plant a new field every two years if he wants to have a regular income from his coffee; each field is of about 0.6 to 0.8 hectare (about 1.5 to 2 acres) and contains in general 1,500 to 2,000 trees. In the first two years the newly cleared land is planted with rice and between the rice plants the coffee is planted at a distance of 2×2 m. (6×6 feet). Thus we get the following planting scheme:—

	1st year	2nd year	3rd year	4th year	5th year	6th year	7th year
1st field . . .	Rice and coffee	Rice and coffee	Coffee, 1st yield (small)	Coffee, 2nd yield (large)	Coffee, 3rd yield (small)	—	—
2nd field .	—	—	Rice and coffee	Rice and coffee	Coffee, 1st yield (small)	Coffee, 2nd yield (large)	Coffee, 3rd yield (small)
3rd field . .	—	—	—	—	Rice and coffee	Rice and coffee	Coffee, 1st yield (small)

The interesting paper of TERGAST gives many other particulars of the native coffee cultivation in the different parts of Sumatra.

'BOTANY.

An interesting new species of coffee from Angola, where it is called "*Kapakala coffee*", was reported by HIRSCHFELDT (24) who gave a short description. It may be supposed that it belongs to the robusta-group, but its botanical characters are still imperfectly known. An interesting morphological character is the ten longitudinal ridges of the fruit. The fruit and the bean are very small. The taste is said to be much appreciated in Angola. A photograph of the dried berries and of the beans was published by the Colonial Institute, Amsterdam (34). Through this Institute plants were grown in Amsterdam from seeds from Angola and some hundreds of plants were sent to the Department of Agriculture, Buitenzorg.

Normally the coffee-fruit contains 2 seeds and not seldom only one seed. As a rare exception we find fruits with more than 2 seeds; such fruits are called "*poly-spermic*" if there is only one endosperm and "*polyembryonic*" if there are two or more endosperms. HILLÉ RIS LAMBERS (35) described polyembryonic seeds of *Coffea robusta* mostly with 3 embryos in one seed, while former investigators, who investigated *Coffea arabica*, *C. liberica* and *C. Laurentii* described polyembryonic seeds, which contained with one single exception 2 embryos. In this publication a description was also given of polyspermic robusta fruits; the largest number of seeds in one fruit was 15; the author considers it very probable that a relation exists between polyspermy, fasciation and luxuriant growth in general.

The question of keeping coffee seed in good condition for some time is of great importance both when the seed must be sent from one country to another and when

the seed ripens several months before the right time of sowing — a situation which is often found in Java.

ULTEE (36) recommends mixing coffee seeds with fine charcoal to 30 % of the weight of the seeds. It is true that it is useful to moisten the charcoal slightly but it is difficult to do this equally over the whole amount of charcoal, and this difficulty makes it advisable not to moisten. The results of the application of dry charcoal have been satisfactory and the decrease of the germinative power is not very important when the seed is not kept longer than 4 months; after this elapse of time there is a risk of an important decline in germinative power.

Very few figures are available regarding the influence of temperature on the growth of the different coffee species. It was therefore interesting to get the figures gathered by GANDRUP (37) about the growth of plantlets of *Coffea arabica* at Djember (altitude 1200 m, daily average temperature 18.0°C.) and at Kalisat (altitude 87 m, daily average temperature 25.1°C). The plants were brought from Kalisat to Djember at an early age when only the two primary leaflets had developed. After two months the plants planted out at Djember had obtained an average height of 35.41 cm., and those at Kalisat an average height of 22.65. The author suggests trying the method of sowing out in the plain and after a few months transporting the plantlets to the plantations in the mountains.

METHODS OF CULTIVATION.

Advice on the methods to be followed in the cultivation of Arabian coffee (*Coffea arabica*) has been given by MILLER (38) and HAARER (39).

For the planter of Arabian coffee the study of these guides will doubtless be very instructive, especially the booklet of HAARER which contains more elaborate and detailed explanations and instructions. But a comparison of the two publications shows at once that in many instances the opinions of the two authors on cultural methods are different, and this is not to be wondered at, for local conditions of soil and climate, cost and skill of labour will make different cultural methods advisable in different countries. Generalisation on cultural methods is always dangerous, and, for instance, in a country like the Netherlands Indies — apart from the *Hemileia* leaf disease — more than one of the cultural methods advocated in the guides mentioned would be unadvisable. This is the case with the methods of soil tillage, of shading and, especially, of pruning.

Some additional information on the cultivation of Arabian coffee in Uganda, Kenya, and Tanganyika Territory is to be found in an article by FRANÇOIS (28). Different varieties are cultivated: one with large beans and bronze coloured young leaves, called "bronze type" (or "local bronze" or "elephant beans"), "Kents coffee", "Jackson coffee", "Nyassa", "Blue Mountain" and "Bourbon". It seems that these varieties have crossed in the plantations and pure types have become rare.

About the use of shade trees opinions seem to differ and it is to be understood that the requirements are not the same in different localities.

New data were collected by MULLER about the reaction of the soil in coffee fields (41). The object was to find whether a relation existed between the appearance of top disease and the Daikuhara acidity, the hydrolytic acidity or the hydrogen-ion concentration of the soil.

On 4 very different types of soil in Sumatra these 3 different kinds of soil reaction were investigated. The results are given in the following table.

Soil No.	Number of sample	Daikuhara acidity	Hydrolytic acidity	Hydrogen-ion concentration
I	{ 39	0.333 \pm 0.017	17.244 \pm 0.652	6.626 \pm 0.044
	{ 41	0.320 \pm 0.016	16.951 \pm 0.608	6.659 \pm 0.031
II	{ 25	0.610 \pm 0.291	24.900 \pm 1.652	6.208 \pm 0.097
	{ 25	0.490 \pm 0.057	23.100 \pm 1.423	6.424 \pm 0.109
III	{ 16	1.319 \pm 0.558	30.156 \pm 3.891	5.788 \pm 0.114
	{ 16	1.070 \pm 0.378	27.031 \pm 2.632	6.013 \pm 0.104
IV	{ 16	3.078 \pm 0.534	54.688 \pm 2.811	5.275 \pm 0.092
	{ 16	2.766 \pm 0.634	50.016 \pm 3.880	5.463 \pm 0.130

Pruning. — In the publications of MILLER (38) and HAARER (39) already mentioned, different systems of pruning of Arabian coffee are discussed. VAN DEN ABEELE (41) gives an account of different pruning systems for robusta coffee in the Congo. This author tries to show the effect of the different systems on the growth of the plant and their advantages and disadvantages.

Nevertheless it is again apparent from these accounts how little is known of the effect of pruning on the tree. This is not to be wondered at, because well arranged pruning experiments on well arranged experimental plots are exceedingly rare and from lack of experimental results we are confined to the results of observations, made on different plantations and in different fields, which do not allow of definite conclusions about the value of the various systems.

At any rate the drastic removal of branches and parts of the stem, as described in the publications mentioned, and, as seems to be practised in African countries, would not be accepted in many other countries as, for instance, Java.

A more detailed discussion of the pruning problem would extend beyond the scope of this review.

Rejuvenation and replanting of old fields. — The question of the rejuvenation and the replanting of old fields is in Java almost as urgent for coffee as it is for rubber. In both cases we meet with the same problem: in the last decades we have obtained by selection strains or races, which are superior to the old planting material in productivity and in other characters, and this makes it very desirable to have the old fields replanted with the improved material. The problem is whether to effect the rejuvenation by removing the old trees and planting new ones, or by stumping the old trees, letting one or more suckers grow and grafting these with slips from selected trees. For the solution of this problem the observation of experimental plots planted in both ways will be necessary. Up till now very few well arranged experiments have been made, but one, which ULTÉE reports (42), may be mentioned here.

In a field of 30-year-old trees a plot of 2.36 bahu (about 1.7 ha.) was replanted in 1925-26 with seedlings of selected trees, in another plot of 1.74 bahu (1.2 ha.), the trees were stumped and the suckers, grown up after the stumping, were grafted from selected trees. This experiment contained also a plot of 1.72 bahu (1.2 ha.) where the trees were stumped. The yield was as follows:—

Yield per bahu (0.7 ha.) in pikul (61 kg.).

	1925-26	1928	1929	1930	total of 3 years
Replanted	3	7	28	38	
Trees stumped and grafted . . .	6	7	18	31	
Trees stumped, not grafted . . .	9	4	22	35	

In this experiment the yield of the 3 plots in the first 3 years did not differ much and a definite conclusion is not yet possible.

On another estate one plot of Quillou coffee, 4-years-old, was stumped and grafted, and one plot 5-years-old was left growing.

In the years 1921-1930 the grafted plot yielded a total of 90 picul per bahu and the seedling plot 85 picul. Here also a definite conclusion is not allowable and it can be said only that the yield of the stumped and grafted plot was satisfactory.

Grafting. — Grafting is on the great number of plantations in Java where the Kawisari-hybrid — a hybrid of a Liberia mother and an arabica father — is grown, a regular part of the plantation work. The experience gained in Java has been described by different writers.

For the Philippine coffee planters grafting is a rather new thing and ROMERO (43) gives for these planters a description of the grafting method and of the results of his own experiments. In general the results of the Java experiments are confirmed. The use of banana leaf petioles and sphagnum as protecting materials for the newly applied graft is a new idea. For the dry season this material is considered to be better than the glass tubes generally used in Java, which proved also in the Philippines to be quite suitable in the rainy season.

Excelsa coffee was found to be in general a better stock than Quillou coffee; it may be recalled here that in Java some Robusta races were found to be better suited than Excelsa as stock for Robusta grafts.

Selection. — Coffee selection on "Banaran-Estate", in Central Java near Magelang, was started in 1912. Dr. C. J. J. VAN HALL and CAESAR VOÛTE issued 3 Progress Reports on this work (1912, 1914, 1917); it was continued by BALLY who issued the 4th Progress Report in 1920. In 1927 the work was continued by Dr. HILDE RUS LAMBERS, who gives in the 5th Progress Report (44) information on the work done in the years 1927, 1928 and 1929.

By VAN HALL and VOÛTE 16 mother trees (Nos. 1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 14, 15, 18, 19 and 21) had been selected in 1912 and 1913, and from each of these 3 plots of descendants were planted, viz. 1 plot with seed obtained by self-pollination, and 2 plots with clones (grafted trees); in one of these grafted plots "stem grafts" had been used, in the other grafted plots "branch grafts". By the term "stem grafts" is meant the tops of stems or watershoots and by the term "branch grafts" the tops of branches.

In this 5th Report the yield is given of each of the 48 plots in the years 1927 to 1929.

In the following list yield figures are given for these three years for the highest yielding plot, the lowest yielding plot, and the average of the 16 seedling plots, of the 16 plots grafted with stem-tops and of the 16 plots grafted with branch-tops.

Average figures of yield in fruit per tree in katti (1 katti = 0.6 kg).

	Highest yielding plot	Lowest yielding plot	Average of the 16 plots
Seedlings	No. 21 12.8 katti	No. 2 5.6 katti	8.4 katti
Stem grafts	No. 4 13.2 »	No. 9 4.5 »	9.1 »
Branch grafts	No. 3 8.1 »	No. 9 1.8 »	4.5 »

From the seedling plots of the most promising numbers new mother-trees have been selected.

For a selection on quality only the size of the bean has been taken into consideration. In this respect the clones as well as the seedlings show great differences.

Preparation. — An extensive review of the work and the machinery for the preparation of Robusta coffee has been given by KNAUS (45).

Experience has shown that the disc-pulpers have too small a capacity. Of the machines used, the Vis-pulper is at present the most popular. In Java about 130 Vis-pulpers are in use; the capacity of the large sized one is about 150 picul (9 tons) of fruit per hour, and that of the small size type is about 80 picul (4 ½ tons) per hour.

Other recommendable pulpers are the Lammers-Lisnet pulper, the Karang Redjo pulper and the Raoeng pulper.

After the pulping it is advisable to eliminate as much as possible of the shells, the coffee damaged by the borer, and the worthless beans. This is generally done by one of the more or less primitive methods, but it is considered more advisable to use for this purpose the "Vis separator" or the "conical tank of Driessen-Holman".

If the coffee is subjected to fermentation, this process should last 24 to 36 hours, not longer. As the object of the fermentation is only to make the pulp easily removable, it is desirable to have it done as quickly as possible. By the fermentation method of GROENEWEGE, which was mentioned in the previous review (see this *Bulletin*, November 1930, p. 414) this aim will perhaps be obtained, but it has not yet been proved that the method is entirely effective.

If one wishes to eliminate fermentation entirely the Raoeng pulper may be used or the beans may be washed in a special washing machine, which works at double speed.

The Rapido washing machine is used on a great number of estates. The only drawback is that its working is not continuous. This drawback has been avoided in the new Vis-washing machine, which consists of a vertical box, in which a cylinder provided with ridges turns with high velocity. The coffee is put in at the top of the box and by the movement of the cylinder is pressed between the box and the cylinder as it moves downward. At the bottom of the cylinder holes are made through which water runs over the coffee. This arrangement has the advantage that without any special supervision the pulp is as much as possible rubbed off while the coffee is still dry; finally water is added. With other arrangements it is always necessary to take special care that the coolies who do the washing do not wet the coffee before the pulp is thoroughly rubbed off.

Washed coffee contains about 55 % water. The general practice in Java is to spread out the washed coffee on drying floors and to leave it there for one morning; during this time the amount of water decreases to about 35 % and the coffee is ready to be dried finally in the drying house. The drawback of this system is the necessity of mechanical transport from the drying floor to the drying house. A new system is in preparation in which the wet coffee is drained and dried on perforated plates over which a strong air current is drawn.

KNAUS deals in detail also with the arrangement of drying houses, hulling machines, sorting machines, and the preparation of the second-rate coffee (damaged, unripe and black coffee).

New machines were demonstrated at the planters' meeting at Malang on 8th May 1930. Some photographs have been reproduced in "*De Bergcultures*" (46).

The natives in the Dutch East Indies prepare the coffee always by the "dry"

method, i. e. the fruits are not properly pulped and washed and generally they are only dried in the sun and hulled. In the West Coast of Sumatra the natives in some regions apply a slightly different method, viz, the ripe fruits are more or less hulled and then dried, before they are hulled a second time and winnowed. In the Palembang residency another method is sometimes applied: the ripe fruits are left fermenting in tins during 4 days, then they are spread out and dried in the sun, and finally are hulled.

The Agricultural Adviser HAGREIS (47) tried the three methods and subjected the coffee to the appreciation of coffee experts. The Palembang method proved to give the best product as regards colour and flavour. The slight fermentation seems thus to exert a favourable influence.

It has been mentioned already that the acerbity in taste of the Liberian coffee grown in Surinam (Dutch Guiana) lowers the market price. FERNANDES (48) investigated the cause of this fault. His conclusion is that after fermentation the Liberian coffee must be dried quickly at a high temperature (80° to 100° C.). For this purpose a special drying machine has been constructed on the basis of the Guardiola. Slight modifications in the drying operations appeared to result in different colour of the bean.

Dr. C. J. J. van HALL.

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AGRICULTURAL ENGINEERING

The Artificial Drying of Forage Crops.

The problem of whether it is possible by the artificial drying of lucerne and meadow grass to obtain a concentrated green fodder rich in protein is becoming increasingly important for all countries which are obliged to import protein-rich fodder.

Artificial drying is not new. During the war large quantities of vegetables, potatoes and fodder were dried. But as soon as economic conditions returned to normal the greater part of the drying plant fell into disuse because it could no longer be worked at a profit.

In Switzerland in several places attempts have been made to cure hay artificially on various forms of racks, in drying tanks or on conveyor driers. The experiments were encouraged by the electric companies in the hope that the working of the fans and heating of the air would utilise power. But it came to be realised that in the first place electric heating cannot compete with coke unless the cost of electricity is extremely low and in the second place the cost of the accessory electric cables is so high that the average farm is able to use electricity only for the fans and must use fuel oil or coke for heating the air.

In England large scale trials have been made of the process developed at Oxford. A fan drives hot air through hay stacked on a wire rack. Difficulties are found however in distributing the hay evenly enough for all parts to become uniformly dried. More satisfactory results have been obtained with the use of trays supplied with hot air by a portable heavy oil burner. This system has not given economic results in Germany because heating with heavy oil is too costly. The experiments have been relinquished in England and the process left to commercial development.

It is in the United States that the most practical experiments along these lines have been carried on of recent years. MASON was probably the first to develop an economically sound system of artificial dehydration and to produce lucerne meal on a commercial scale. He utilises a conveyor for passing the material through a drying tunnel approximately 150 feet long, where it is exposed to heated gases which are forced up and down through it. MASON has developed special machinery for all the operations from the cutting of the lucerne to the storage of the meal in the barn. Large mowers cut the fresh lucerne and pass it on to carts at the side. At the drier the lucerne is shot from the carts, chopped and charged on to the conveyor. The dry hay is removed at the outlet end of the tunnel, ground and driven into the storage barn by a fan.

The process has been modified slightly by FULMER. He allows the cut grass to wilt somewhat in the swathe so that when it enters the drier it has a water con-

tent of only 50 to 60 % instead of 75 to 80 %. There is thus considerable economy of fuel.

Several other drying installations in the United States are based on principles similar to those of MASON and FULMER. The ARNOLD drier is of a different type. It is composed of three communicating drums through which the green forage is drawn by air suction. The current of air causes the small leaves which dry rapidly to pass through the drum more quickly than the more moist stems.

In the KOON drier the forage to be dried is driven by a fan through a system of pipes together with the heating gases. The dry parts are eliminated by a winnower and the still moist parts come again into contact with the hot gases and are driven through more pipes.

There are a number of other driers more or less corresponding to those described. It is said that there are in all about 18 private installations for drying lucerne and hay. The products are sold mainly to poultry farmers, in Europe as well as in the United States.

In Sweden and Denmark also of recent years much attention has been paid to the question of the artificial curing of hay. The preliminary trials of the 'Peco' drier, which is made in Sweden and works on the pneumatic system, have now been brought to an end. The 'Hessicator' drum drier, built in Denmark on Swedish designs, is also sufficiently advanced for its practical utility to be tried out.

In Germany the first experiments with the artificial curing of hay were carried out some time before the war. The municipalities of Berlin and Friburg for some time dried the hay from the sewage irrigated meadows, which is particularly valuable on account of its high protein content. Similar experiments were tried also in Bavaria. A farmer in Silesia has adapted his whole farming system to artificial drying of forage and no longer requires to buy concentrates.

All these drying installations however supplied the direct requirements of the farm and not the general market. Artificial drying was considered rather as a protection against bad weather than as an accessory branch of agriculture. The good results obtained by poultry farms in Germany, however, by the use of meal of lucerne and grass and the increasing exportation of these meals to satisfy the demand, have led the commercial firms and research institutes in the country to devote more attention to the subject.

In Germany also various different types of drying plant are in use, such as tray driers, conveyor driers, drum and pneumatic driers. It would occupy too much space to describe in detail all these installations, for the development of forage driers is by no means at an end. It would seem of more use to say something of the general work of the "Trocknungsausschuss beim Reichskuratorium für Technik in der Landwirtschaft" (Crop Drying Committee of the German Agricultural Engineering Council). This Committee has not considered it necessary to develop a special process of drying but has devoted itself to determining accurately the fundamental requirements of a forage crop dehydrator.

It was recognised first in America, by MASON, that artificial drying could never be an economic proposition unless it produced a fodder of high value. The lucerne was cut when it was young and possessed the highest content in readily digestible protein. The German Crop Drying Committee has carried the idea still further and has tried to increase the protein content of the forage by heavy applications of nitrogenous fertilisers and artificial watering, cutting the crop frequently (4 or 5 times) and drying it artificially.

To produce rapid growth of grass in spite of repeated mowing, as much as 50, 100 and 200 kg. of nitrogenous chemical fertilisers were applied per hectare on the trial plots. Spray irrigation was used to obtain the full benefit of the fertiliser. Certain plots received a little water often, others much at a time but seldom, and others no watering at all.

The crops are cut when they have their highest content of available protein. They are then quite young and are particularly liable to mechanical injury. Comparative trials made of the ordinary hay-making system, curing on trestle racks and artificial drying showed that the last process caused less wastage, as the small leaves containing most protein were not lost. If the crop is cut 4 or 5 times a year it would not be possible in the climate of Germany to obtain hay as early and as late without artificial curing.

Field trials have clearly demonstrated that frequent mowing gives a lower total annual yield of dry matter than mowing twice only. But the yield in protein is about one-third higher on the plots heavily manured and frequently cut. Calculations to determine whether the heavy manuring has produced a correspondingly higher yield have shown that the plots cut several times have utilised the manure better than those cut only twice. It seemed however that the optimum dressing of nitrogen had been passed with the 200 kg. of N, particularly on the plots cut only twice. Calculations of the money equivalent show a dressing of 100 kg. of N to be economic, for although with smaller dressings (50 kg) there is less expenditure, the yield is much lower.

Unfortunately it has been found that reed grass (*Phalaris arundinacea*), which has a particularly high protein content, is sensitive to repeated cutting. This shows that it is necessary to seek a forage plant which is genuinely suited to artificial drying.

The uses of the artificially dried grass must now be mentioned. At the experimental drying plant part is compressed into balls and sent to various testing stations for feeding experiments to determine the nutritive value of the artificially cured fodder as compared with that naturally cured. A large part of the grass is finely ground in a special mill and sent to poultry farms.

The mixed fodders found on the market in Germany nearly all contain lucerne hay meal. Most of this comes from abroad; it is not possible to give the exact figures, though the quantity of imported meal is estimated at 15,000 quintals per annum. The American lucerne meal is preferred because it contains less cellulose than the African sun-dried lucerne meal. The foreign meals have a rich dark colour, unlike the German naturally dried meals. Buyers, specially poultry farmers, prefer the foreign green forage meals (or the German artificially dried meals) because they give the eggs the dark yoke colour preferred on the market.

The economic utility of the artificial drying of forage crops is still contested in some quarters. It must be recognised that driers used only as a protection against bad weather cannot be profitable. Drying of crops grown on the farm may however be remunerative if the capital outlay involved is not too high. But the matter is of considerable importance in connexion with heavily manured forage crops, the full value of the high protein content of which cannot be utilised without artificial drying.

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ANIMAL HUSBANDRY

Notes.

FEEDING WHEAT TO LIVE STOCK. — As stated in the *Agricultural Gazette of New South Wales* (April 1931) by S. L. BLACK, a considerable amount of attention is at present being given to the possibility of making profitable use of wheat as a food for live stock in New South Wales. The writer refers to a number of experiments made in different countries on this subject and concludes, that ruminants are in better position to deal satisfactorily with the grain on account of the preparation which the food has undergone before having entered the fourth or true stomach. Wheat may, nevertheless, be fed to horses to advantage provided due discretion is exercised in its use. Wheat can be used as a sole concentrate for dairy cows if some nitrogenous bulky food is given, such as lucerne chaff or other legume. Mixed concentrate is, however, to be preferred. As in the case of horses it should be a fed to cattle not whole but as ground or rolled wheat. As a portion of the ration of fattening cattle, wheat has given better results than oats. Wheat is preferably fed whole to sheep. In America it is considered slightly superior to maize for these animals, but in New South Wales the experience is that maize gives better results. For young and growing swine wheat is much superior to corn. For fattening purposes they are about equal, but the quality of bacon produced from wheat-fed pigs is considered superior. Whole wheat constitutes a valuable grain ration for poultry and can be used either alone or mixed with cracked corn.

FEEDING TRIALS WITH DAIRY COWS IN THE NETHERLANDS. — In the periodical *Verlagen van Landbouwkundige Onderzoekingen* (s'Gravenhage 1931, No. XXXVI) E. BROUWER gives an account of some feeding experiments with potato pulp and cabbage palm sago.

The potato pulp was compared with sugar beet slices mixed with molasses, which is a feed of high value for dairy cattle. It was found slightly inferior to the beet and molasses, but may be considered a good feed. The sago was compared with a mixture of groundnut and maize meals.

The milk yield during the two years of the experiments was higher sometimes with one, sometimes with the other. The sago increased the fat production of the cows and the fat content of the milk; the latter remained high up to the end of the principal period of the experiment, which lasted about 8 weeks each year. The content in dry matter and casein of the milk scarcely changed and there were no appreciable differences in live weight.

FEEDING TRIALS OF DAIRY COWS WITH FRESH AND DRIED SUGAR BEET IN GERMANY. — Experiments comparing the value of fresh and dried sugar beet and beet cossettes as feed for cows have been carried out at Halle by FROELICH and LUETHGE, who describe them in the *Mitteilungen der Deutschen Landwirtschafts-Gesellschaft* (Stück 24, 1931). It was found that dried beet and dried cossettes (after the first sugar extraction) both are a good basic ration for dairy cows.

The food value of each depends on the content in digestible nutritive elements, so that if dried cossettes are replaced by dried untreated beet attention must be paid to the food value.

Fresh sugar beet, like mangolds, constitute a feed of high value for dairy cows. The starch value of sugar beet corresponds to the quantity of digestible principles they contain: 20 kg. of sugar beet may be substituted for 50 kg. of mangolds.

ENSILAGE AND HIGH QUALITY MILK. — In various regions producing hard cheeses doubts have been expressed about the possibility of using green fodder ensilage as a feed for dairy cows and in districts aiming at the production of first quality milk there is pronounced opposition to its use. These facts led to some careful tests being undertaken to determine the influence of ensilage on milk. The results of the experiments have just been published in *Die Futterkonservierung* (Berlin 1931, Band III, Heft 2). It is found that by the use of well-constructed silos and careful observation of the necessary precautions, young green fodder, rich in protein, can be converted by fermentation in the cold into a product containing lactic but not butyric acid. This form of ensilage may safely be used, as the experiments have shown, for dairy cows giving first quality milk.

Geographical Aspects.

BEEF PRODUCTION IN THE PHILIPPINES. — An interesting account of beef production in the Philippines is given by STANTON YOUNGBERG, Director of the Bureau of Animal Industry of Manila, in the *Philippine Journal of Agriculture* (Vol. I, No. 4, 1930). The cattle are not a native breed. Statistics of cattle numbers go no further back than 1891 when there were just under one million head. Cattle plague was introduced into the Islands in 1886 and caused such havoc that in 1894 there remained only the small number of resistant animals. In 1928 the head of cattle again exceeded a million, and was composed of a breed of Mexican origin and one of Chinese. The latter is divided into 2 types, the Batangas and the Ilocos. Since 1909 there has been considerable cross-breeding with zebras imported from India, and good results have been obtained. The conditions of the Islands are favourable for cattle breeding apart from epidemics, to which Indian zebras are found highly resistant. Although the meat consumption is low, not exceeding 1.46 kg. per head per annum, the Philippines still have to import a large part of their meat requirements.

MILK PRODUCTION IN SPAIN. — In Spain milk is furnished by 20.8 % of the cattle, and 43 % of the goats. These figures are remarkable in comparison with other countries as, for example, France, where 52.8 % of the cattle produce milk. The average production is 1120 litres per cow, 21 litres per sheep and 126 litres per goat. Of the total milk production 803 million litres, or 74 %, are cows' milk, 7 % is sheep's and 19 % goats milk. The greater part of the milk is consumed fresh (*Revue de Zootechnie*, Paris 1931 No. 6).

Horses.

EXPERIMENTS WITH WINTER SHOERING. — In number 13 of the *Tijdschrift voor diergeneeskunde*, Utrecht (Holland), July 1931, Prof. H. M. KROON describes some experiments carried out with several methods of winter shoeing. The following anti-slipping devices were used: — the Norwegian rubber shoe «Imperator», the English rubber shoeing «Non-slip», the English «Gragrips» shoes with flexible bridge and rubber pad and Dr. STADHOUDER's asphalt shoe. None of these shoes proved to be a satisfactory anti-slipping device on icy and snowy roads. Sharpened calkins remain also indispensable. On asphalt and other slippery pavements the Norwegian shoe proved the most satisfactory. However, it quickly wears off which renders it very expensive.

The Non-Slip and Gragrips shoes proved satisfactory only during a few days because they quickly wore off or, especially the latter, were quickly bent.

Dr. STADHOUDER's shoe was of little use either, the grooves being quickly worn off.

The experiments were carried out on heavy draught horses because most of the horses used in town belong to this category.

Cattle.

TAILLESS COWS AND COWS WITH 2 OR 3 TEATS IN ARMENIA. — In the *Zeitschrift für Züchtung* (Reihe B, July 1931) Prof. ERIZIAN reports several cases of cows with 2 teats and one case of a cow with 3 teats observed in the Soviet Republic of Armenia. It is not a case of simple atrophy but a complete disappearance of the other teats. Prof. ERIZIAN proposes to study these anomalies from a hereditary point of view, as also two cases of tailless cows observed also in Armenia.

GERMAN FRIESIAN COW BEATS THE WORLD'S RECORD DAIRY PRODUCTION. — It is stated in the *Deutsche Landwirtschaftliche Tierzucht* (No. 24, Hannover 1931) that the cow «Gertind 132182» has produced in 365 days 13,879 kg. of milk with a fat content of 4.44 %, i. e., a total fat yield of 613.1 kg. This cow has thus, according to the official figures of the German Herdbook, beaten by 1 kilo the previous record for fat production held by the cow «De Kol Plus Segis Dixie» belonging to the United States Carnation Society. The world record for quantity of milk is still held by the American cow «Segis Pietertje Prospekt», which has given 16 956 kg. of milk, but only 526 kg. of fat.

Official confirmation of still higher yields reported to have been obtained in other countries, such as Hungary, is still lacking.

DAIRY CONTROL AND ITS ORGANISATION: XVTH INTERNATIONAL AGRICULTURAL CONGRESS AT PRAGUE AND THE INTERNATIONAL MILK CONGRESS AT COPENHAGEN, 1931. — As a result of the report of Prof. CONSTANTINESCO (Bucharest) the Prague Congress passed the following resolutions:—

- (1) That the necessary efforts should be made in all parts to make general the testing of the yield of individual cows;
- (2) That the results of the tests should be entered in the herdbooks as well as on the individual records in order to complete the breed characteristics;
- (3) That in order that the technique of milk yield testing and the guarantee of the authenticity of the information recorded may be effected on an international plan, a Sub-Commission of the International Agricultural Commission should be formed to study the question on the basis of the previous reports presented to the Congress; this Sub-Commission shall also submit to the recommendations of the Zootechnical Section of the Scientific Council of the International Institute of Agriculture;
- (4) That as close a collaboration as possible should be ensured between practical stock breeders and zootechnical experts in order to make the best possible use of herdbook data and of the milk yield tests.

At the Copenhagen Congress a report was presented by Mr. S. TAUSSIG (Rome) on the international organisation of dairy cow testing, in which proposals were made for international coordination of the technique of control in order to ensure comparable results from an international standpoint.

BROWN CATTLE HERDBOOK AND DAIRY CONTROL, IN THE PROVINCE OF PARMA (ITALY). — In agreement with the Fascist Federation of Farmers and the Itinerant Agricultural School of Parma a Stockbreeders' Section has been formed for the purpose of starting a Herdbook of the Brown Cattle and establishing regular dairy cow testing. The *Avvenire agricola* (June 1931) publishes the statutes and regulations governing the activities of the Section.

Sheep.

SHEEP BREEDING CONFERENCE AT ROTHAMSTED. — The "Place of sheep in modern farming" formed the subject of a Conference at Rothamsted on March 24. Mr. J. Egerton Quedest, Chairman of the Farmers' Club occupied the chair and speakers included sheep farmers from Scotland and from the principal sheep districts of England.

The papers revealed, as stated in the *Journal of the Ministry of Agriculture* (Vol. XXXVIII, No. 2, May 1931) a growing preference for grazing sheep. It soon became clear that no single breed is equally well suited to all conditions and all circumstances.

THE COLONIAL WOOL DAY, PARIS, 16 JUNE 1931. — The Colonial Wool Day held at the Colonial Exhibition at Paris was a complete success. At the morning and afternoon meetings were present a number of important industrialists, traders, breeders and others interested to associate themselves with this manifestation of the activities of the 'Unions Ovines' in overseas France. Amongst the most interesting addresses delivered may be mentioned:— Sheep farming and wool production in Morocco and North Africa (M. VELU, Veterinary surgeon) — The possibilities of sheep raising in Algeria (M. TROUETTE, Veterinary surgeon) — Wool production in the British Empire (Mr. Joseph CLAY) — Influence of testicle grafting on the fleece (Dr. VORONOFF). *L'Union ovine*, 1931, n° 7).

Pigs.

MEMORANDUM OF THE ARGENTINE PIG BREEDERS' ASSOCIATION TO THE MINISTRY OF AGRICULTURE OF ARGENTINA. — In consequence of a crisis in the pig breeding industry, which in Argentina has possibilities of a great future, the Pig Breeders' Association presented a memorandum (which is reproduced in full in the *Revista de la Asociación Argentina Criadores de Cerdos*) drawing the attention of the Ministry of Agriculture to the unjust burdens laid on the industry which hinder its progress in spite of all efforts to protect the stock from disease and to ensure the circulation of the products, particularly to English markets. The pig industry might become one of the most flourishing in the country if instead of selling wheat at very low prices it were converted into pork butchers' products. But, while other branches of production enjoy Government encouragement,

the pig industry is weighed down by export duties, by railway rates 100 % higher than for other goods and heavy internal charges. Moreover, pig production does not enjoy the advantages of Law No. 11,228 concerning the marketing of livestock, nor is the insurance of pigs against tuberculosis included in this law.

The memorandum therefore requests that (1) the duties, charges and railway rates which weigh upon the pig industry may be reduced; (2) that this industry may be accorded the same measure of Government protection as the other branches of production of the country.

Poultry.

SOUTHERN RHODESIA EGG LAYING TEST. — The 11th egg-laying test of Southern Rhodesia, which commenced on 1st March 1930 and terminated on the 30th January 1931 was, according to the *Rhodesia Agricultural Journal* (March, 1931) the most successful test yet held in that Colony. Apart from the condition of the birds, which was excellent all through, ten pens exceeded the 1000 egg mark, the highest being 1143 eggs and the lowest 1002 eggs for the 48 weeks duration of the test.

Fur Farming.

STOCK-BOOK FOR FUR-BEARING ANIMALS IN GERMANY. — As stated by Prof. H. HENSELER in the *Landwirtschaftliche Pelztierzucht* (Hannover, 1931, Heft 6, pp. 81-89) the special Fur Farming Commission of the German Agricultural Society has decided to form a Stock-book for fur animals. Preparations are already in hand. Prof. HENSELER makes detailed proposals on the subject of the organisation of the stockbook and data to serve as a basis for its arrangement. He also gives samples of the register to be used.

S. T.

AGRICULTURAL INDUSTRIES

Notes.

INDUSTRIES OF PLANT PRODUCTS. EFFECTS ON BAKING OF THE CHLORIDE OF BENZOYLE USED FOR BLEACHING RYE FLOUR. — Experiments carried out by H. DILLER have shown that bleaching with chloride of benzoyle has disadvantages both for the baker and the consumer. The dough rises less and more slowly, giving a close heavy bread with more moisture and acidity, and consequently less readily digestible. In spite of these defects the better colour produces the illusion that the bread is of better quality. (*Zeitschrift für Untersuchung der Lebensmittel*, Berlin 1931, Band 62, Heft 1-2).

APPLICATION OF THE OXFORD PROCESS IN SUGAR MANUFACTURE. — This process for the extraction of sugar from dried beet slices has caused much comment. The principal results given by the use of this process during last season at the factory of Neuville-Housset (France) are given below.

(1) Carbonatation and filtration of the raw juice at 30° Brix gives excellent results, reducing the quantity of lime used by a quarter.

(2) The high sugar content of the juice makes concentration without direct steam possible.

(3) The production capacity of the factory is increased by one-third.

(4) The apparent purity of the juice is 84-86, with a pH of about 6.2. The concentrated juice contained lime, but this did not interfere with crystallisation.

(5) The cassettes must be dried at a temperature not exceeding 120°C. Saccharose losses by inversion during drying were 0.063 %.

(6) The factory is studying apparatus reducing the pulverisation of the slices to a minimum and thus facilitating factory processes. (P. ORTE, *Bulletin de l'Association des Chimistes de Sucrierie, de Distillerie et des Industries Agricoles*, Paris 1931, n° 5).

INFLUENCE OF THE NITROGEN CONTENT OF BEET IN SUGAR MANUFACTURE. — In warm dry years sugar beets contain more nitrogen than in wet years. A number of experiments in sugar factories show that beet with a low content in amido and ammo-

niacal nitrogen gives a clarified juice which retains its alkalinity better during evaporation and, after concentration, allows of a greatly facilitated crystallisation. (*Journal d'agriculture pratique*, Paris 1931, tome II, n° 40).

THE 'MELIN' MACHINE FOR COMPRESSING LOAF SUGAR. — The whole amount of sugar corresponding to the total weight of loaf sugar to be produced is introduced at one time into the mould ; it is compressed partly by a small grooved piston, and partly by a solid piston with a diameter equal to the base of the loaf required. The advantages of the system are a good output, great reduction of labour, of power and of costs of installation and working. (*Bulletin de l'Association des Chimistes de Sucrene, de Distillerie et des Industries agricoles*, Paris 1931, n° 5).

MANUFACTURE OF REDUCING SUGARS FROM CELLULOSE IN RUSSIA. — At the request of the 'Vsechimprom' trust Prof. BERGIUS has undertaken the direction of the construction of an experimental factory in Moscow for producing reducing sugars from cellulose. The process is as follows:—

Cellulose with a 10 % water content is treated with steam until it is reduced to a pulp with a mean water content of 30 % ; it is then hydrolysed with gaseous HCl and converted into sugar at 60-70°C by the introduction of an inert gas and steam. The product is desiccated under reduced pressure, then submitted to aqueous extraction and the residue hydrolysed anew. The dried residue from the final operation can be incorporated in various foodstuffs.

A NEW USE FOR THE DEFECATION SCUMS OF CANE SUGAR FACTORIES. — Since 1927 the 'Société Industrielle et Agricole' of Pointe-à-Pitre (French Antilles) has been investigating the best method of preserving the defecation cakes from cane sugar manufacture.

The analyses of REGNAUDIN show that these cakes have a similar composition to non-decorticated cottonseed cake.

	Defecation cake	Cottonseed cake
Protein	8.98 %	13.62 %
Fats	7.80 %	2.83 %
Non-nitrogenous extractives	39.87 %	45.07 %
Cellulose	11.43 %	23.36 %
Moisture	16.56 %	11.47 %

The net nutritive value in digestible starch of the cane sugar defecation cake is calculated as follows:— 46.61 (starch value) \times 0.84 (coefficient of productivity) = 39.15, a value which corresponds to that of the non-decorticated cottonseed cake. To preserve it the defecation cake is treated in the universal desiccator usually used for drying crop products, heated by exhaust gases and provided with an accessory furnace for burning fuel. The moisture content of the product is thus reduced from 65 to 12 %. The non-dried defecation scums may also be used as a fertiliser, which is rich in nitrogenous matter, in lime and in potash. (*Bulletin de l'Association des Chimistes de Sucrene, de Distillerie et des Industries agricoles*, Paris 1931, n° 9).

FLAVOURS CAUSED BY THE USE OF CONCENTRATED MUSTS IN WINE. — In reference to the Decree of 1 August 1931 (France) authorising the use in wine making of musts concentrated to over 10 %, M. L. MATHIEU draws attention to the modifications observed in the wines and musts and the unpleasant flavours due to prolonged cooking or to high temperatures. He considers that the 'jam flavour' (oxidation of certain products by heat) may be avoided by boiling in a closed vessel in the presence of a reducing agent (SO₂) which does not attack the metal containers. The 'hay flavour', produced slowly in the cold in musts rich in chlorophyll, may also be avoided ; but it is very difficult to eliminate the 'caramel' and 'burnt' flavours (produced by dissociation of the sugars, organic acids, starch and pectic substances, etc.) which persist after fermentation, retard it and often change completely the type of wine. (*Revue de Viticulture*, Paris 1931, n° 1938).

OZONE TREATMENT OF WINES. — A series of experiments carried out on 4 types of wines — (1) a white wine, little fermented, non-sulphured, (2) a white wine of about 10°, sulphured, (3) a white wine from a hybrid, foxy, slightly sulphured, (4) a white wine of about 9°, dry, slightly sulphured — have shown that the treatment of white wines with ozone has beneficial effects. It stabilises wines containing non-fermented sugar, it acts as a preventative against various wine diseases and removes the foxy flavour from hybrid wines. (MARSAIS F., *Revue de Viticulture*, Paris 1931, n° 1936).

URONIC ACID, GLUCOSE AND GALACTOSE OBTAINED BY HYDROLYSIS OF CERTAIN OPTICALLY ACTIVE SUBSTANCES IN COMPLETELY FERMENTED WINES. — PARIS and DELLA BARBA have shown that the soluble substance in alcohol which is mainly the cause of the reducing action of dry wines contains only traces of already formed galactose, but instead there are more complex bodies giving by hydrolysis uronic acid, glucose and galactose. (*Giornale di Biologia applicata all'Industria chimica*, Bologna 1931, n° 3).

COMPLETE UTILISATION OF OLEAGINOUS SEEDS BY THE DAVID PROCESS. — Fresh seeds, very finely crushed in a special apparatus are beaten up in the required quantity of water. A milk is obtained containing the oil in emulsion, the albuminoids in pseudo-solution and the starch and cellulose debris in suspension.

The oily liquid is separated from the starch and cellulose by slow centrifuging and a cake is obtained retaining still a little oil and the nitrogenous substances.

The oil is then separated from the protein solution by rapid centrifuging. By bringing the pH of the fat-free protein solution to the value required in each case, the albuminoid characteristic of the seed treated (legumin or casein of soya bean, groundnut, etc.) is precipitated.

The numerous applications in foodstuffs and in industry (galalite, glues, etc.) of vegetable casein are well known (see this *Bulletin* 1931, No. 1, pp. 14-31). The oil recovered from the first juice is of fine quality, keeps well and is equal to the best oils extracted by pressure.

The loss of fat (approximately 4.5 %) corresponds to the fat retained in the cake, which is used as a cattle cake. The process of F. DAVID may also be used for obtaining nitrogenous substances, often of particular interest, from the oil-freed cake.

According to the inventor the value (88 fr.) of the vegetable casein extracted (22 %) greatly exceeds the price of ordinary cattle cakes (36 fr. per quintal). (*Recherches et Inventions*, 1931, n° 198, p. 87).

RETTING OF RAMIE. — The PLAETINCK mechanical system of defibrating ramie would appear to give a good yield of cheap, fine quality fibre. The process uses special rollers and beaters worked by low power engines. The plant is of simple construction and durable, and a minimum amount of labour is required and that unskilled. (*Bulletin agricole du Congo Belge*, 1930, n° 3).

INDUSTRIES OF ANIMAL PRODUCTS,

RESEARCH ON THE DECOMPOSITION OF SMOKED FISH. — It has been found by SCHOENBERG that there are 2 entirely different kinds of decomposition:—

(1) Putrefaction due to bacteria contained in the water, or 'moist' putrefaction, due to the raw material lacking freshness.

(2) Putrefaction due to micrococci, or 'dry' putrefaction, which affects products prepared with fresh materials but preserved badly or too long.

There are cases intermediate between the two types.

The characteristics of decomposition and the analytical methods employed for the different kinds of fish are described. (*Zeitschrift für Fleisch- und Milchwirtschaft*, Berlin 1931, Jahrgang, XLII, Heft 1, p. 5-10).

SOME OF THE CHARACTERISTICS OF YEASTS FOUND IN FERMENTING HONEY. — An interesting study carried out by G. E. MARVIN, W. H. PETERSON, E. B. FRED and H. F. WILSON dealing with this subject appeared in the *Journal of Agricultural Research* (July 15, 1931). Under present conditions of greatly increased production, honey is often stored for many months, perhaps years, and, when stored under unfavourable conditions may undergo decided changes in flavour and colour which reduce it to an inferior market

grade. But a problem of greater importance in the storage of honey is that of fermentation. Fermented honey is of frequent occurrence and many recent cases have been noted which show that fermentation is not a result of contamination due to unsanitary methods of handling. The organisms which cause the fermentation are normally found in association with bees and the bees are responsible for their spread in new honeys. These organisms are not killed during the ripening of the honey, and therefore develop at certain temperatures when the physical conditions of honey are changed through granulation. About equal quantities of carbon dioxide and alcohol (rarely over 5 %), together with small amounts of non volatile acids, form the chief fermentation products. Some of the isolated yeasts correspond with previously described species, two species appear new.

Fermentation of honey can be prevented by heating the honey to 160°F., pailing it while hot, and cooling it immediately. Honey in storage will not ferment if kept at temperatures below 52°F.

BOOK REVIEWS *

Soil Science.

EMERSON PAUL, *Principles of Soil Technology*, xv + 402 pp., illustr. New York 1930, Macmillan.

[The work is subdivided in the following sections :— (1) Soils in general, their formation and classification, (2) Physical properties and functions of soils; (3) Chemical properties and functions of soils, (4) Soil biology]

Before studying soil formation Part I gives a summary of the theories on soil origins and of the geological history of the Earth.

Each of the other parts concludes with a short chapter on the relationships between soils and plant growth.

Numerous references to recent literature are given in footnotes. An appendix of 45 pages contains soil maps, climate and vegetation charts, tables of mechanical and chemical analyses of typical soils, and a glossary of technical terms largely borrowed from the Report of the Terminology Commission of the American Soil Survey Association].

Livestock.

STANG-WIRTH, *Tierheilkunde und Tierzucht*, 9. Band. Urban & Schwarzenberg, Berlin-Wien 1931.

[Volume 9 of this excellent Encyclopaedia of Veterinary Medicine and Animal Husbandry, like its predecessors, contains a series of articles by specialists in both branches and on the geography of stock breeding.]

Articles on *Sheep* and *Pigs* by VON FALCK give a special importance to breeds, as has been the case with all the articles on livestock. The origin and evolution of the domestic sheep are studied; the breeds are described and are classified according to wool characteristics, because the writer considers it difficult to classify by origin or external characters on account of the variability in appearance produced by extensive cross-breeding. Most attention is paid naturally to German breeds. The article on *Pigs and Pig Breeding* follows the same lines as that on sheep.

Sericulture is dealt with by R. GRANDORI in a detailed article with excellent illustrations.

Two important articles are devoted to the *Building of cowsheds and stables* and *Cowshed hygiene*, by A. JENTSCH and K. WAGENER respectively. The former article deals in turn with :— Choice of site — Building plans — Description of buildings — Estimates of costs — Position and outline of each building — Distribution of buildings — Internal arrangements — Buildings adapted for different kinds of stock — Building contracts — Execution of building work.

* Under this head short synopses are given of books sent for review.

The article on stable and cowshed hygiene includes a table for the appreciation of the hygienic conditions of a shed for dairy cows, giving points for interior management, for cleanliness of shed and animals, for feeding and watering conditions.

There is also an interesting article by E. FEIGE on the *Measures for the encouragement of stock breeding*.

The volume contains accounts of stock breeding in the following countries :— Sweden, by NYSTROEM — Switzerland, by DUERST — Yugoslavia, by ULMANSKY — Spain, by SALAZAR — South America as a whole, by STANG — Argentina, by RUPPERT — Uruguay, by MATTOS — Venezuela, by STANG — Syria, by BOEHLKE — Palestine by STURMANN.

These articles give a general description of the natural and economic conditions of the country and an account of stock breeding practice with details of the breeds raised. The photographs of the breeds would alone give a considerable value to this volume].

WALTHER Prof. Dr., *Der Sumpfbiber (Nutria)*, 148 p., München 1931, Verlag von F. C. Mayer, Sparkassenstrasse 11. Preis : 10 R. M.

[A new edition of this small handbook on the breeding of the nutria (*Myocastor coypus*) in captivity.

It is only recently that the systematic breeding of this useful fur animal has been undertaken in Germany, but it has already found a secure footing. The nutria is entirely herbivorous, feeding on even coarse aquatic plants of no value, and so is inexpensive to rear, in comparison with other fur-bearing animals.

The new edition of Dr. WALTHER'S (Professor in the Agricultural College of Hohenheim, Wurtemberg) book has been eagerly awaited. It has been entirely re-written and takes into account all the most recent experiments. The habits and requirements of the nutria are described and much information given concerning its management, the construction of enclosures, feeding, the value of the skins, etc. There are good illustrations, notably coloured plates showing the different types of fur].

FORESTRY

Recent studies on the poplar.

The world demand for the soft timbers furnished by broad leaved trees is constantly rising and the marked development of the cultivation of such trees has become an appreciable source of profit. Production in the chief exporting countries such as Sweden, Finland, Poland, Estonia, West Africa, etc. all the time and to an increasing degree falls short of the requirements of the importing countries. For example the United States consume annually an amount of timber of this class which is 25 times greater than the annual increment, while France, Great Britain, Italy, Germany and a number of other countries are also importers by force of circumstances.

Hence the question of the cultivation of poplars of different kinds is very prominent at the present time. Authorities in different parts of the world claim that the poplar is the only broad leaved tree, which in their country, owing to the remarkable rapidity of its growth is capable of yielding large scale timber in 35-40 years or even less. As DUTERME, the Belgian expert, rightly says, this capacity for rapid growth makes the poplar particularly important for the small owner. The cost of planting and of maintenance is lower in the case of the poplar than for any other species and hence in many countries it is now regarded as the most profitable. In the words of LECOMTE (France), "poplar planting is an excellent investment".

Uses of the poplar. — These are many and various. Writers belonging to countries, which are importers of paper and cellulose, testify to its high value in the

manufacture of paper pulp and the importance of other methods of utilising the poplar and poplar products is becoming increasingly recognised. Among the chief of these may be mentioned the use of the wood in the manufacture of clogs, packing cases, fruit containers, matches, etc. There is a constant increase in the demand for white-wood furniture and poplar wood is now in constant use for veneers (DUTERME). In carpenter's work and joinery, it seems probable that it is destined largely to take the place of oak, which is growing relatively rare.

One of the most valuable characteristics of the poplar is its capacity for bringing about rapid soil improvement, especially in the case of marsh lands. The strongly marked and continuous transpiration of its leaves and rapid consumption of subterranean waters, which are among its special features, make it particularly useful for the reclamation of swampy areas. HICKEL (France) states that it is also possible by poplar cultivation to improve lands that are non-irrigable and have a high content in salt, while at the same time this tree can also be used to advantage for consolidating the soil on the banks of mountain torrents.

Soil. — The poplar's comparative indifference to the nature of the soil goes far to explain the value of its cultivation for the improvement of unproductive lands. It may be said that all kinds of fresh soils are quite suitable, though the presence of stagnant water may be prejudicial. Marshlands should therefore be drained before planting; otherwise the plantations should be made on rising ground. Certain kinds of poplar fare excellently on sandy soils. CRAHAYE (Belgium) recommends *Populus canadensis*, GOMBOCZ (Hungary) *P. alba*, DENGLE and RUBNER (Germany) *P. tremula* for sandy soils. HICKEL refers to the poplars of the sub-species *Turanga*, which are resistant to soils heavily impregnated with salt. BRETON-BONNARD and DUTERME state that peat soils are also very well suited for poplar growing, though it is always desirable to correct the acidity of such soils by the application of lime and possibly also of good soil where the trees are planted. RAZZETTI and EMILIANI (Italy) urge the planting of poplars in the "golene" (i. e., the extremities of a river bed not constantly under water) of the Italian rivers, claiming for them a great superiority from the hydrotechnical standpoint over other trees and especially over willows. Furthermore DUTERME calls attention to the capacity of the poplar to withstand the fumes of sulphur, which makes it possible to grow the tree in places which would be fatal to other species, such as the neighbourhood of works consuming sulphurous coal, large railway stations, factories, etc.

Reproduction. — As a general rule the poplar is reproduced by striking though experiments have been made with various other methods especially with growing from seed, the main object in this case being the production of new hybrids having a more rapid growth than the present varieties and providing a superior class of timber. DUTERME speaks of the employment of suckers of the Picardy poplar in which a piece of the root is removed with the sucker so as to facilitate striking. BRETON-BONNARD, has also successfully used root budding as also shoots and layering.

These different methods should however be regarded as exceptional. Big slip direct planting, using 3-4 year old branches about 3 metres in length, which has also been recommended finds no favour with VAN TILT (Belgium), on the ground that weak rooting retards the growth of the trees. It appears that the most practical system is to use strong healthy young plants, 2-3 years old, originating in cuttings raised in the nursery.

Cuttings and slips. — Almost all authorities are agreed that it is undesirable to make use of cuttings from stool shoots; by preference they should be taken from branches of mature trees or from young plants. On the other hand LEATHER (Great Britain), dealing solely with *P. canadensis*, is of opinion that the best cuttings are stool shoots from felled trees. Disagreement is still more marked regarding the choice of the subjects from which the branches for striking should be taken. VAN TILT is of opinion that the best and the easiest to obtain are those from one year old branches properly ripened and selected from the strongest 2-3 years old trees in the nursery. BRETON-BONNARD prefers cuttings from the "water sprouts" of old trees when well nourished, one or two years old and by choice axillary. BACHALA (France) also considers that trees must be not less than 10 years old in order to give good cuttings. LEATHER holds the directly opposite view and declares that lateral shoots of very young trees should be used and that cuttings from old trees are unsatisfactory. According to DUTERME cuttings taken from the upper third of the tops of 15-20 year old trees give the best results and that "water sprouts" resulting from pruning are not so successful as might be desired.

The selection of cuttings and choice of strong and absolutely healthy trees as their source may prove particularly valuable in the prevention of cryptogamic disease among poplars. BRETON-BONNARD's view that cuttings should never be taken from stool shoots is partly based on the fact that tree stumps are very often thus attacked. LIESE (Germany) recommends that in order to avoid the chances of disease, cuttings should be made from the upper parts of the branch ("Kopfstecklinge") which, afterwards will not show wounds above ground level which are liable to cryptogamic infection. On the other hand BRETON-BONNARD is strongly opposed to the use of the upper part of the branches as being as a rule insufficiently ripened.

Hence it may be stated as a general rule that only first quality specimens should be used for planting, without branches, and with smooth, unbroken bark. Specimens from poor, cankered, insect ridden trees or those attacked by poplar disease should be unhesitatingly rejected even at the risk of increased expense. BRETON-BONNARD further points out that, in afforesting lands or pastures in the neighbourhood of inhabited areas, cuttings from male trees only should be used so as to avoid the production of down in June and July which causes coughing among cattle and is a source of considerable inconvenience to human beings. The length of the cutting varies in accordance with the size of the plantation. In the nursery it is usually 25 cm. Though VAN TILT advises 20-25 cm., BRETON-BONNARD 25-30 cm. and TRONCO (Italy) 30 cm. For direct permanent planting a much longer cutting is used, BRETON-BONNARD recommending 30-50 cm., LEATHER 90-120 cm. and DUTERME 125-150 cm.

Most authorities consider that the best results are obtained when the cuttings are taken at the time of planting or a few days previously. BRETON-BONNARD however prefers to put his slips in earth for several months head downwards so as to obtain rapid root production.

LEATHER describes a trial made with a fine set of cuttings of *P. canadensis* taken in the autumn and laid in a damp trench. By the spring the cuttings had not only made roots but also long crown sprouts and were in excellent condition. Cuttings require to be buried in the soil with only from 1-3 buds (or, according to BRETON-BONNARD 5 cm.) above the surface. TRONCO notes that the use of the dibble should be avoided as it tends to cake the soil, rendering root development more difficult.

The majority of experts hold that during the Spring following striking, the

cutting produced plants should be transplanted to the nursery, remaining there for 2 years, so that they will be 3 years old at the time of permanent plantation.

The spacing of the cuttings at the time of the first plantation should be as follows : according to BRETON-BONNARD, 15 cm. between and 25 cm. within the rows ; according to DUTERME, 25-30 cm. both between and within the rows ; according to van TILT, 30-35 cm. between and 10-15 within the rows, *i. e.*, about 3,000 cuttings per are (four poles). Planting distances in the nursery are naturally greater and range from 80 to 100 cm. between and from 50 to 60 cm. within the rows.

TRONCO is against planting out in the nursery. He suggests a distance of not less than 100 cm. between and of 40 cm. within the rows. Under this arrangement the plants during their first year reach a height of 3-4 metres and a girth of 6-7 cm. He holds the view that cuttings more closely planted and planted out become unduly tall and thin and are thus very liable to damage by wind when permanently placed in position. Moreover he considers that for fertile soils plants two years of age and never older should be adopted while poor or average soils should be planted with one-year specimens, since, as such plants are not yet very strongly developed, they are less affected by the nature of the soil and more readily adaptable to the new environmental conditions. The cultivation methods to be adopted in the nursery are well known. They include frequent hoeing, especially during the first year, weeding in the second, lopping and clearing of the better developed plants in the third. Watering is recommended for nurseries on very dry soils only.

Cultivation on the permanent site. Felling age. — In the past the poplar was only grown along the roadside or on the borders of avenues and occasionally also in meadows ; it was only rarely to be found in forest conditions, being reckoned a tree of little value. For a long time it has been considered that, as the poplar is characterised by exceptional light requirements and is adversely affected by shade, it could not be grown in stands. At the same time a few instances of stands of *P. tremula* were to be seen in Northern Europe and in the United States. VAN TILT has however shown that *poplars grown in clumps* give the best timber, though, as he points out, it must always be remembered that poplars must be planted at such distances apart as will avoid any entanglement of branches until the trees are ripe for felling.

Opinions differ very widely as to the most suitable spacing and the time for exploitation. BRETON-BONNARD considers that the best yields are obtained with dense high forest with successive thinnings. He recommends five metres spacing in each direction, giving 400 trees to the hectare, 200 being removed at the age of 25 years and 100 more at 30 years or so, so as to leave 100 at the time of the final cutting, which generally takes place at the age of about 40 years. He refers also to a 6 × 6 metres spacing as satisfactory for the production of heavy trees and in this case the removal of 100 trees and the felling of the remainder at the age of 40-45 years.

DUTERME is also in favour of the 5 × 5 metres spacing, but he would eliminate 25 % after 15 years and a further 25 % after 30 years, thus leaving 200 trees per hectare still standing at the time of final cutting. He is opposed to any sudden elimination of 50 % of the trees between the ages of 15 and 25 years, since such a course exposes the trees that are still left standing to risks of wind damage, particularly on light or moist soils. In such conditions he would prefer an 8-9 metres spacing both ways, utilising it for an undergrowth of alder, a system which is highly desirable from the economic standpoint as also from that of the natural pruning of the poplar boles.

According to VAN TILT all the trees in a poplar plantation should be felled at the same time when they have reached the dimensions most suitable for trade requirements. The choice of spacing limits and the time of the final cut must depend, as he says, on the type of timber that it is desired to produce. For clog making trees of relatively small dimensions (125 cm. in girth) will suffice while for the manufacture of matches a larger tree with a girth of 150 cm. is required. The experiments made by VAN TILT cause him to recommend the following spacing scales : (1) 7.15×7.70 metres for the production of trees with a girth of 137 cm. for felling after 20 years ; (2) 7.15×8.34 metres for trees with a girth of 157 cm. for felling after 25 years ; (3) 8.34×9.09 metres for 177 cm. trees for felling after 30 years ; (4) 8.34×10 metres for 194 cm. trees for felling after 35 years. A poplar plantation should always be made in the quincunx pattern.

The results of TRONCO's work are quite different from those above described. He favours 8-10 metres spacing between rows and 2.5 metres spacing only within them or preferably planting in rows with alternate spacings of 3 and 16 metres ; inside the rows the trees should be only two metres apart. He claims that with this method he can obtain the best yield in shortest time.

The Review *Il Legno* (1930, No. 10) describes poplar plantations in the valley of the Adda (Lombardy), which when felled 10 years after permanent planting, provided stems with a diameter of 35-40 cm. These trees were originally placed at 10 and 3 metres distance between and within the rows respectively.

DUTERME considers that 35-45 years is the best age for felling from the economic standpoint. He is opposed to exploitation at the stage when the volume increment process is most marked. Clumps of *P. canadensis* aged 35-40 years are capable of doubling their yield during the last 10 years of their life.

RAZZETTI, describing his experience of the " golene " of the Po valley, states that it is possible to increase the yield of *P. canadensis* stands by extending the usual 10 year rotation to 14 years.

The method of *soil preparation* for the definitive planting out is similar to that for the nursery except in cases where the lands have hitherto been left uncultivated.

It is further highly important, according to LECOMTE (France), that special attention should be paid to the cultivation of the trees after planting in their permanent home. It is very desirable that the lower part of the plant should be earthed up to a depth of 25-30 cm. especially in very damp soils. This process causes the formation of a new root crown above the old roots and a consequential increase in the rapidity of the development of the tree. In order to obtain well grown stands the trees should be cleared during the second year and pruned at suitable intervals. Artificial to supplement natural lopping should be avoided as far as possible though timely steps should be taken to prevent the growth of large branches, for the tardy cutting of such branches naturally causes serious wounding. Much mischief may result from clumsy, neglected or retarded lopping.

Diseases and Pests. — The diseases and pests which affect the poplar are very numerous and persons who have established poplar plantations complain bitterly of the destruction caused thereby. The cultivation of the poplar has been seriously developed during the last ten years only but a number of authorities are already declaring that important plantations have proved almost a complete failure and that it is impossible to find effective methods of protection against the majority of the diseases of the poplar, especially those of the cryptogamic type.

The conditions in which the latter are developed are not as yet precisely de-

terminated. The only thing that is certain is that any kind of injury caused to the tree in the form of the cutting or breaking off of a young branch, puncturing by insects, pruning lesions, etc. encourages the diffusion of these diseases. REGNIER (France) has noted this fact for *Micrococcus Populi*, QUAIRIÈRE (Belgium) for *Dothichiza populea*, CRAHAY (Belgium) for *Gyalopus populi* and *Nectria ditissima*.

The measures of control generally proposed include the following : (1) the formation of the nursery at a distance from the centres of diseases infection ; (2) the choice of cuttings from absolutely healthy specimens ; (3) care in securing that the specimens for transplantation from the nursery are free from infection (REGNIER) ; (4) antiseptic treatment of lesions, cuttings and young plants ; (5) avoidance of exposure of the roots to the air (QUAIRIÈRE) ; (6) careful selection of the varieties for planting in particular localities (GRAHAY) ; (7) the cutting and burning of all affected branches, whether dead or dying, and the burning of all waste products as a general measure of controlling all forms of infection and of insect damage.

M. LIESE believes that the main cause of the onset of rot, decay and change of colour lies in a bad system of striking. He recommends that the cuttings should be buried deep in the ground with a single bud only showing above the soil surface. The centre in which infection can develop will be thus of the smallest dimensions and will disappear the more quickly.

RABOUILLET (France) finds the explanation of poor success with poplar plantations in the following causes : (1) ill adaptation of the root system to the constitution of the forest soil ; (2) such a tree as the poplar, which requires a great deal of light, is ill adapted for the close quarters of a stand. He considers that the poplar varieties as grown to-day are rather suited to cultivation in horticultural than in silvicultural conditions. Hence he recommends not merely a special study of the diseases in question but also research work for discovering the optimum conditions for the plant life of the poplar.

JACOMETTI finds an explanation for the spread of *Dothichiza populea* and *Didymosphaeria populina* in the fact that in Italy large scale poplar growing is chiefly confined to *P. canadensis* to the exclusion of other varieties and that in such large scale growing, attention has not been given to the diffusion of canker, etc. He believes however that the cultivation of the Canadian poplar should be continued and that the remedy is to be found either in the importation of the original species or in the production and diffusion of hybrids between this and other species which are specially resistant to disease.

It is also probable that the many insects which feed on poplar sap convey disease from tree to tree and are the chief source of the original attack (REGNIER). Of these insects the most generally known is *Cossus ligniperda*, and others which are particularly destructive include *Sesia apiiformis*, *Lina populi*, *Bombyx salicis*, *Saperda populnea*, *Saperda charcharias*, *Zeuzera aesculi*. The best means of protection against insect pests are not as yet fully known and it is necessary to study the life history of these pests.

Species and varieties. — The different species and varieties of the poplar are very numerous. BRETON-BONNARD gives the number at round about 120, without including the hybrids recently obtained, of which the number increases daily. DALLIMORE and RUSSELL BURDON (Great Britain) have recently published the results of the experiments of Prof. HENRY (Great Britain) who has made successful crossings between *P. angulata* var. *cordata* and *P. trichocarpa*, the result being the hybrid known as *P. generosa*, which has a more rapid growth than the parent species and also than that of almost all other poplars.

RIBITSCH (Italy) believes that the hybrids obtained by Prof. KEE (U.S.A.) gives the most rapid growth and WETTSTEIN WESTERSHEIM (Germany) has reported on the results of experiments in crossing *P. alba*, *P. tremula* and *P. canadensis*. GOMBOCZ, dealing solely with Hungary, gives a list of 50 hybrids, resulting from natural or artificial crossings between *P. alba* and *P. tremula*. TRONCO, DUTERME, TJURIN (U.S.S.R.), JACOMETTI, HICKEL, MEELKER (Netherlands) give lists of the varieties and new hybrids to be found in their respective countries and report on their good and bad features. The conclusion suggested by the information supplied is that there should be a speeding-up of the process of discovering new varieties, adapted as far as possible to local conditions, resistant to disease and producing high class timber.

G. LUNCZ.

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Notes.

RADICAL CHANGES IN THE FORESTRY POLICY OF THE SOVIET UNION. — According to a communication to "Skogen" (Stockholm 1931, No. 17), the Council of Soviet Commissaries has issued a Decree whereby the methods of forest utilisation in certain regions have been materially modified and a return to a more systematic silviculture insisted.

The Forest Administration of the Soviet Union was transferred, by a Decree, dated 25 February 1930, from the Commissariat of Agriculture to the Supreme Council which controls the industrial interests of the State. This change was brought about in order to establish a more satisfactory balance between the continuous development of forest exploitation and the internal demand for timber, which had risen as a result of rapid industrialisation and a largely increased export trade. It had been found necessary at all hazards to augment both felling and production without regard to the essential principles of a well regulated silviculture. The result was to be seen in uncontrolled utilisation of forest resources, particularly noticeable in Central Russia and Ukraina, which are well supplied with means of transport and carry a large population.

The rapid destruction of entire forest areas but even more the alarm caused by the conspicuous reduction of the amount of water borne by the chief rivers of the country caused the authorities to introduce a new Decree, which is in part absolutely contrary to the former ordinance.

Under the terms of the Decree of 31 July 1931 the forests belonging to the Union are classed in two categories, viz., the felling zone and the zone of silviculture. The forests belonging to the first Category are under the administration of the Supreme Council and are to be worked on lines of the highest possible production, except in the case of certain regions of special importance from the point of view of water supply. At the same time forests belonging to the zone of silviculture as well as those of Ukraina, the Central region of the "Black Earth" or Tchernosiom Region, of the Lower Volga, of the Crimea and of the Northern Caucasus as also the steppes of Siberia and Kasakstan and certain other districts which are scantily provided with forests will remain under the charge of the Commissariat of Agriculture. In the forests zones belonging to this second category the annual cut must not exceed the amount of the annual increment. It is intended, during the course of the next three years gradually to reduce fellings so that in 1935 a correct relation between cut and increment may be reached. In the first place it is necessary to limit cuts on the areas situated on the banks of the rivers and in addition a scheme must be prepared for closing down the great exploiting enterprises in the "silviculture zone" and for transferring their activities elsewhere.

The new Decree apparently makes provision for the establishment of a belt of protection forests one kilometre deep along the central and lower reaches of the Volga, and also along the banks of the Dnieper, the Don and the Ural and in these protection forests all kinds of exploitation are forbidden. The reduction of fellings in the "silviculture zone" will not be limited to the State forests but will also apply to the commercial forests, which will now be brought under a much more rigid State control than in the past.

The new Decree also lays down the silvicultural principles to be followed in dealing with areas which have been over-exploited and areas in the "silviculture zone" which have for a long time suffered from drought. A number of improvement schemes are proposed especially in cases where the normal water supply to the rivers is likely to benefit. Stress is also laid on the checking of erosions due to excessive fellings, which are so prejudicial to agriculture. In addition the Commissariat of Agriculture has been requested to take steps for establishing a protection belt against the parching west winds between the Ural mountains and the Caspian Sea. It is however probable that serious difficulties of climate and unfavourable soils will make it difficult to give practical effect to this scheme.

It will thus be seen that, as regards the smaller but at the same time highly important group of the forests of the Soviet Union the methods of exploitation hitherto followed will be greatly modified. So radical a reform in forest policy may tend to a marked increase in the costs of timber production and also to check its development and it is considered likely that these factors will not be without their influence on the export trade in Russian timber.

R. W.

RESOLUTIONS OF THE INTERNATIONAL CONGRESS OF TIMBER AND FORESTRY, PARIS 1931. — According to "Le Bois" (Paris 1931, Nos 36-37), the second Section of this Congress was particularly concerned with the problems of forestry and timber production. Questions of general interest were brought before the meetings by reporters of different nationalities and as a result of the discussions in the groups into which the Section was divided, the following recommendations were presented to the plenary meeting of the Section and adopted:—

Control of the origin of forest seeds. — The Congress, referring to the resolutions on this question adopted by the World Forestry Congress at Rome and by the Inter-

national Association of Forestry Research Stations at Stockholm, recommends that each country should institute an organisation for the purpose of carrying out on sound technical principles the control of the origin of forest seeds.

Regeneration of the oak. — Having regard to the general importance of oak growing and the desirability of having as satisfactory a supply of timber as possible, both from the point of view of quantity and of quality while providing for an adequate natural regeneration of this valuable species, the Congress recommends that the question of the selection felling of the oak should be very carefully studied in those countries in which an even-aged high forest system has not proved entirely satisfactory.

Tests of increment. — In view of the value in many cases of the borings made with the PRESSLER borer for the calculation of increment, the Congress recommends that in experiment stations where a regular stocktaking of the stands is carried out (and particularly in selection and irregularly felled stands) auger borings should be carried out with the object of ascertaining the rate of mass increment and of checking the value of yield calculations based on the results of the boring system by reference to the results of carefully compiled censuses.

Exotic species — The Congress recommends that in every typical geological and climatic region small stands should be formed in carefully selected areas in the State Forests, either in the form of clumps covering a few "ares" (1) or of fire protection strips serving also for the planting of mother trees, with the object of making a comparative and extended study of certain exotic species which it seems desirable from the economic standpoint to introduce and to cultivate in forest conditions.

The Douglas Centenary. — The Congress expresses the hope that the Centenary of the death of David DOUGLAS, whose name is perpetuated in the Douglas fir (*Pseudotsuga Douglasii*), will be celebrated throughout the world in 1934, and that in connection with this anniversary every Nation will collect a full and detailed documentation, describing the results obtained with the stands of this tree.

Pasturage reform. — The Congress is of opinion that : (1) all possible steps should be taken for the improvement of pasture lands after determination of the areas that are essential for cattle-raising ; (2) for this purpose the number of local research stations should be increased with the object of obtaining information as to the results of the cultivation of pasture lands, such results to be collected by national research institutions ; (3) the question of pasturage legislation should be considered in such countries or regions as do not at present possess such legislation.

Privately owned Forests. Independent Associations. — The Congress, taking into account the highly valuable results obtained in certain countries by owners' associations, established for purposes of reafforestation and of forest preservation, recommends that each Nation should, under the auspices and with the aid of the Government, adopt suitable measures for the encouragement of the establishment and development of such associations.

Afforestation. — Considering that there are considerable areas of waste or uncultivated lands in all countries and that the development of such lands by means of afforestation, in so far as this is possible, is a matter affecting general interest ;

that the groupings of owners for the purposes of any form of afforestation on uncultivated lands represent a movement on the part of private persons, deserving every encouragement ;

that the work thus carried out over areas of a considerable extension is economically advantageous for the country as a whole ;

that, apart from the public service thus rendered, these groupings serve a very effective form of propaganda in favour of afforestation by the example given and the confidence created ;

the Congress recommends the States to use every effort to promote the development of uncultivated lands : (1) by undertaking directly the reafforestation of such lands as are unfavourably situated by reason of height, climate and the poor quality of the soil ; (2) by contributing generously towards the cost of afforestation schemes promoted both by private individuals and by the associations that they may form among themselves for the collective afforestation of large areas, the persons thus benefiting being simply required to submit to the control of the Forest Service as regards the use made of the grants accorded.

Controlled Forests. — The Congress recommends that the various countries shall consider the drafting of special regulations for a form of "forest control" whereby in return for the voluntary acceptance of certain special obligations respecting exploitation methods the owners may enjoy the benefit of appropriate fiscal provisions.

Forest Fires. — The Congress, having regard to the necessity for encouraging in all countries measures for the protection of forests against fire and for the control of forest fires, recommends that, in all extensive forest areas where the risks of fire are considerable, owners' associations shall be established with generous subsidies from the national forest department, and that, in conjunction with such associations, the public authorities shall set up a complete system of fixed observation posts, equipped with all kinds of signalling apparatus.

Forest Pathology. — In view of the fact that trees of many kinds, particularly the Elm, Chestnut, Poplar and *Pseudotsuga* are all to a greater or less degree seriously affected by cryptogamic diseases and that in each case there are species, varieties, strains, types and hybrids that are specially resistant to these diseases, the Congress expresses the hope that experimental work for the discovery of the species, varieties, strains, types and hybrids having a relatively high degree of resistance, will be organised and carried out in the different regions or countries and more particularly where trees affected by such diseases are to be found.

R. W.

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MONTHLY BULLETIN

OF

AGRICULTURAL SCIENCE AND PRACTICE

GENERAL AGRONOMY AND CROPS OF TEMPERATE REGIONS

Notes.

I. GENERAL AGRONOMY.

Meteorology.

DETONATIONS OF UNKNOWN NATURE PRECEDING SOLAR AND ATMOSPHERIC DISTURBANCES. — In the *Revue scientifique illustrée* (1931, No. 10, p 310) M. Albert NODON gives the interesting facts that are summarised below.

In the afternoon of 16 February 1931 he heard at Bordeaux powerful detonations appearing to come from a distance out to sea; they resembled gunfire or explosions of mines and occurred with varying intensity at intervals of 3 or 4 minutes in a foggy and calm atmosphere

His solar observations on 15 and 17 February seemed to show that a large sunspot (*joyer*) was forming in the eastern region of the sun precisely during the afternoon of the 16th. This sunspot grew rapidly and became visible to the naked eye in the following days; it was continually changing in shape, electric and magnetic disturbances began to be apparent and the atmospheric pressure fell rapidly.

Large atmospheric and electromagnetic disturbances were produced over the whole of Europe during the ten following days and were in many places accompanied by storms, heavy rains, snow and floods; they ceased only after the disappearance of the sunspot on the western rim of the sun. The detonations were not heard again during the period of disturbances.

This was not by any means the first time that the writer had made an observation of this kind. Fifteen years before he had occasion to report several times detonations similar to these. Similar observations have also been made in various parts of the world, such as the Gulf of Bengal, Brazil, Colombia, Syria, the North Sea, Germany, Bohemia and Italy. In England and Belgium such detonations are well known and have vernacular names.

Various opinions have been expressed regarding the origin of the phenomenon, e.g. seismic, atmospheric, electric, etc., without any further precision. The detonations heard at Bordeaux were generally attributed to artillery practice, but the writer's investigations showed that there was no gunfire on that day and that the detonations cannot be attributed to known causes. He is of the opinion that the cause may be similar to that of the electromagnetic disturbances which also occur during the formation of large sunspots and are caused by profound atmospheric disturbances. It is hoped that further and more complete observations will make it possible to determine the cause more precisely.

T. B.

Soil Science.

INTERNATIONAL CONFERENCE OF RHABDOMANCY AND GEOPHYSICS, VERONA, ITALY, 20-25 MARCH 1932. — The 'Ente geo-rabdicco italiano' and the 'Ente autonomo della Fiera di Agricoltura di Verona' are organising this Congress which is to be particularly concerned with the agricultural applications of the two sciences. The programme is as follows: —

I. R h a b d o m a n c y .

A. Scientific Section.

- (1) Scientific definition of rhabdomancy;
- (2) General nomenclature of the science.
- (3) Relationship between the behaviour of the divining rod, the pendulum and the human body in scientific applications.

B. Practice and Technique.

- (1) Technique of rhabdomancy as applied in industry, agriculture and medicine.
- (2) Physical and mechanical means of assisting or replacing the diviner.
- (3) The divining power. Organisation and control of diviners.

II. G e o p h y s i c s .

A. Scientific Section.

- (1) Methods and systems of research.
- (2) Geophysics as an aid and control of rhabdomancy.

B. Practice and Technique.

- (1) Practical applications and experiments.
- (2) Geophysical surveys and their practical applications.

The Congress will close with an excursion on Lake Garda organised by the Committee of Verona (*Rassegna Geo-Rabdomica*, Organo Ufficiale dell'Ente Geo-Rabdomico Italiano, Roma, 1931, Fascicolo N. 7-8, p. 1-3).

DETERMINATION OF THE ORGANIC MATTER OF THE SOIL. — After comparison of various methods of determination Dr. Ubaldo BOCCASSINI (Agricultural Experiment Station of Bari, Italy) has arrived at the opinion that the most simple, rapid and certain method is aqueous oxidation with a mixture of chromic anhydride and sulphuric acid followed by titration of the residual chromic anhydride. This method gives higher figures than the method of oxidation by permanganate of potash, which was selected recently for the soil analyses for the preparation of the agrological map of Italy. (Dr. U. BOCCASSINI, *Determinazione della materia organica nel terreno*. Bari, Stazione agraria, 1931).

DISTRIBUTION OF THE PRINCIPAL ELEMENTS IN SOIL GRADED ACCORDING TO FINENESS OF PARTICLES. — In 3 different soils Dr. UBALDO BOCCASSINI has studied the distribution of the organic matter, lime, nitrogen, phosphoric acid and potash in the different lots of soil separated by mechanical analysis.

He finds that in a given soil the content in the various fertiliser elements may vary in the lots of different degrees of fineness, sometimes increasing, sometimes diminishing with the fineness. In the soils studied the elements which varied most were the organic matter, the lime and potash; the nitrogen and phosphoric acid varied less.

To give results which can be applied in practice the determination of the fertiliser elements should be carried out in the whole soil, or at least to the soil with particles 5 mm. in diameter; otherwise the variation in composition between the different grades of fineness will be greater than that produced by tillage, crop rotation and fertilising. (*Annali di Tecnica Agraria*, pubblicati dal Sindacato Nazionale Fascista Tecnici Agricoli, Roma, 1931, Anno IV, Fasc. III, pp. 243-251).

TITANIUM IN SOILS OF MORAVIA, CZECHOSLOVAKIA. — The content and distribution of titanium (total and soluble in 20 % HCl) in the principal soil types of Moravia have been studied by Dr. Bohuslav MALAC.

All the soils have a high titanium content, usually exceeding 0.5 % and sometimes 1 %. An accumulation of titanium (total and soluble in HCl) occurs in the illuvial (deep) horizon in accordance with the observed laws of displacement of sesquioxides in the soil. On the other hand, a typical podsol shows in the eluvial (surface) horizon a definite diminution of titanium in both forms.

These results show that in Moravia there is a displacement of titanium in the soil.

profiles from above downwards (*Věstník Československé Akademie Zemědělské* (Bulletin of the Czechoslovakian Academy of Agriculture), Prague, 1931, Vol. VII, No. 6, 7, pp. 665-668).

Soil Improvement.

CONSUMPTION OF FERTILISERS IN SPAIN. — During the year from September 1, 1929-August 31, 1930 the following quantities of fertilisers were consumed in Spain :

Fertiliser	Quantity in tons
Superphosphates	893,317
Natural phosphates	7,064
Basic slag	11,225
Ammonium sulphate	195,522
Sodium nitrate	86,762
Calcium nitrate	14,766
Calcium cyanamide	2,784
Potassium chloride	25,558
Potassium sulphate	23,235
Potassium nitrate	1,761
Kainit	522
Complete fertilisers	104,964

(*The American Fertilizer*, Philadelphia 1931, Vol. 75, No. 1, p. 46).

USE OF CHEMICAL FERTILISERS IN RUMANIA. — The consumption of fertilisers is low (15,000 tons in 1929) and those used are almost entirely produced in the country. In 1929 the sugar beet crops were given 4000 tons of fertilisers, and in 1930 6000 tons.

This low consumption of fertilisers is explained by the natural fertility of the soil, the large supplies of farmyard manure and the reluctance of the peasant to accept new methods. Thus it is thought improbable that the use of chemical fertilisers will increase to any great extent for some years yet, at any rate in the great plains of the Danube, the steppes of Bessarabia and the valleys of Transylvania. Although these regions have been cultivated for many centuries their fertility is little diminished owing to the general practice of crop rotation (cereals — lucerne — clover — beans — oil yielding crops) and periodic grazing. (*The American Fertilizer*, Philadelphia 1931, Vol. 75, No. 3, p. 27).

PHOSPHATE PENETRATION IN SOILS. — Interesting results have been obtained regarding phosphate penetration by STEPHENSON and CHAPMAN (*Journal of the American Society of Agronomy*, October 1931, pp. 759-770).

Water and acid extracts of soils which had received from 1 to 30 or more annual applications of a phosphate-carrying fertiliser compared with similar soils which had not received phosphate showed appreciable penetration of the phosphate below the surface foot in light to medium-textured soils, but little in heavy soils.

A more rapid penetration of phosphorus is effected through a few heavy applications rather than more numerous lighter doses.

Comparisons of the relative penetration of phosphate from bone meal, superphosphate and manure gave several important results. After 22 annual applications there was no evidence of phosphate penetration below 12 inches in plots receiving bone meal, as compared with marked penetration in plots receiving superphosphate and manure. There are indications that the phosphorus in manure moves readily through the soil or else some effect of organic matter facilitates the more rapid penetration of phosphorus.

In nearly all the soils receiving phosphate over a period of years there has been a marked accumulation in the surface 6 to 12 inches.

T. B.

FERTILISING EFFECT OF MANGANESE IN CERTAIN SOILS OF FLORIDA. — In southern Florida a fine calcareous silt deposited by sea water is so poor in manganese that this element is the limiting factor of growth. The tomato plants grown there on a large scale suffer from a chlorosis producing white spots between the leaf veins, their production of flowers and fruits becomes insignificant and their life is short.

Heavy applications (up to 20 quintals per ha.) of the usual balanced fertilisers have no beneficial effect on the affected plants, but small quantities (e.g., 56 kg. per ha.) of manganese sulphate make the plants remarkably vigorous, give them a dark green colour and greatly increase their production of flower and fruit.

As a result of the success of the manganese sulphate its use has become widespread in the region to the south of the Miami river for the cultivation of beet, carrots, lettuce, cabbages, potatoes, beans, etc., which previously did not succeed and showed the same disease symptoms described for the tomatoes.

The greater part of the soils of the United States however contain sufficient manganese for crop requirements. Regions such as Florida which are deficient in manganese are exceptional. (*The American Fertilizer*, Philadelphia 1931, Vol. 74, No. 13, p. 48).

T. B.

Ecology.

THE INFLUENCE OF CLIMATE ON PLANTS. — Climate is one of the environmental factors requiring adaptation and it is only when a plant or animal species is fully adapted that it can remain more or less immutable. Otherwise it must perish or be modified until it becomes completely acclimatised.

According to K. WEGENER (*Meteorologische Zeitschrift* 1931, Band 48, Heft 4, pp. 125-128) the factors which can modify species are:— (1) crossbreeding, (2) adaptation to (a) competition with other species, (b) pests and disease, (c) climate (food supply), (d) soil.

From his observations he considers that the food supply is more dependent on climate than on the soil; climate, and consequently food supply, modify organisms more rapidly than does the natural selection in competition with other species and enemies to which DARWIN attributed the dominating influence. In practice climate should be of equal importance to cross-breeding.

For practical purposes it is rarely attempted to alter a species by transplanting it to another climate. Thus the German vine which is derived from southern vines with very sweet grapes, by adaptation to the climate of Germany produces wines that are somewhat acid and poor in sugar, but they are preferred to the wines of the regions having a specifically wine-producing climate and higher prices are paid for them. In general, then, no change in species is desirable; the practical grower requires to know rather within what limits of change of climate a plant species will remain stable.

The works on botanical geography dealing with the natural distribution of species unfortunately give no precise information on this point. For instance, the eucalyptus, which is a native of Australia, is now the commonest tree in South America. In Uruguay the most widely spread wild tree is the peach, which is an introduced species. Botanical geography would seem to be more of historical than practical value.

On the other hand it may be noted that artificial selection as commonly practised to-day, does not produce stable forms; selection must be continued or else the plants tend to return to the natural state. It is not possible to distinguish with certainty such a case from one in which a cultivated form is degenerating under the influence only of change of climate.

Regions of constant humidity in which the temperature never falls below 0°C are characterised by a vegetation (bananas, pineapples, rubber) which cannot withstand frost.

On the other hand the limit between the resting period and active growth may be determined both by a temperature of 7° to 8°C and by a certain degree of drought (not yet clearly defined); hence in regions in which the temperature never falls below 7°C growth is constant wherever there is adequate humidity (fern forests), for the air filled with water vapour causes nocturnal dews which favour growth more than do the occasional heavy rains. In general there are two resting periods for vegetation: either two dry periods, or a dry period and a cold period, which has the same effect.

The complex action of climate on plant growth cannot yet be expressed in figures; for the moment it is better to continue defining climate by a characteristic plant, e.g., the beech climate, the banana climate, etc.

T. B.

II CROPS OF TEMPERATE REGIONS.

FIELD TECHNIQUE IN CEREAL EXPERIMENTS. — In view of the complexity of agricultural research any simplification of technique leading to a saving of work and field space is welcome. Experiments have been carried out at Rothamsted Experimental Station to test the accuracy of a method of estimating the yield of small cereal plots by taking samples. The results of harvesting by the sampling method 210 plots of about 1/40th. acre in area were compared with the results of large scale harvesting of the same plots. It was found that the sampling error per plot was 5.6 % of the mean yield and that these errors are sufficiently low for there to be little loss of information. The advantages of the method are obvious, for example, plots too small for large-scale experimentation can be used, edge rows can be discarded without the necessity of removing them, losses in the stook and in the stack are avoided and the results are available sooner than would be the case with stacked corn. The field technique is described in detail in the *Journal of Agricultural Science* (April 1931, pp. 366-390) and an account is given of a small combined thrasher and winnower which was constructed for the purpose of dealing rapidly with the numerous small sheaves.

A further paper in the same number (pp. 191-208) shows that the practical field experimenter who desires the highest degree of scientific accuracy in his experiments should be careful to avoid systematic plans and should arrange his plots at random.

A. M. F.

EFFECTS OF SORGHUM RESIDUES ON CROP YIELDS. — It is an accepted fact in the United States that crops planted in the autumn after sorghums do not yield as well as when following other crops. This has been proved by practically all the experimental data available. But the question is debatable whether the sorghum residues alone or both the crops and residues are responsible.

An experiment was carried out as follows:— In pots containing loam mixed with each of the various crop residues was sown Marquis wheat and the pots were maintained under optimum moisture conditions throughout the experiment. The crop was harvested when a few of the plants had headed. The following results were obtained:—

Residues incorporated with soil	Yield of wheat in grams
Maize tops ground (1 ½ tons per acre)	75.3
Kafir tops ground (1 ½ tons)	74.5
Milo tops ground (1 ½ tons)	65.3
Wheat straw ground (1 ½ tons)	67.0
Kafir tops chopped (1 ½ tons)	78.2
Maize roots ground (1 ½ tons)	73.2
Kafir tops ground (3 tons)	56.2
Milo roots ground (1 ½ tons)	72.7
No residue	62.7

This experiment showed that sorghum residues applied to the soil at the rate of 1 ½ tons per acre had varying effects, depending on the kind of plant, whether tops or roots were used and the physical condition of the residues. Compared to the control there was no depression due to sorghum residues (unless added in large amounts), and in some cases increased yields occurred. The increased yields from sorghum residues may be less than from maize or other residues, although this is not always the case. When excessively large amounts of organic matter with a wide N : C ratio are incorporated with the soil depressing effects on crop growth become evident. It is possible that the decreased yields of crops following sorghum may be partially explained on the basis of

readily decomposable materials in the residues, but such a theory will not satisfactorily explain the large depressions in crop yields reported by some investigators. (A. D. MC-KINLEY, *Journal of the American Society of Agronomy*, 1931, No. 10).

AN INDICATION THAT MAIZE TILLERS MAY NOURISH THE MAIN STALK UNDER CERTAIN CONDITIONS. — The following experimental results were obtained by G. H. DUNGAN (*Journal of the American Society of Agronomy*, 1931, No. 8).

Removing tillers from maize plants in the early milk stage caused a slight reduction in yield, although the differences were not statistically significant.

Comparison of the yield of grain from plants with and without tillers showed a slight superiority for the plants with tillers, but here again no significance can be attached to the differences observed.

Defoliation of plants with and without tillers when the grain was in the early milk stage resulted in striking superiority of the plants with tillers. The differences were statistically significant.

A similar defoliation test made when the heads were just emerging resulted in no further growth of the main stalk, but a more rapid main stalk-like growth of the tiller.

DURATION OF THE FLOWERLESS CONDITION OF CERTAIN PLANTS IN RESPONSE TO UNFAVORABLE LENGTHS OF DAY. — It is of some interest to know how long a herbaceous plant can be maintained in a flowerless, growing condition by a suitable length of day. It is found by GARNER and ALLARD (*Journal of Agricultural Research*, 1931, No. 5) that an unfavourable length of day does not merely temporarily inhibit flowering but may prevent it as long as short days are allowed to operate. On the other hand, a long period of suppressed flowering has shown no tendency to develop a persistent non-flowering condition, nor has it left any tendency to delayed flowering when the plants are again exposed to normal day lengths.

Not all plants behaved similarly. While sedums remained growing vigorously in a vegetative condition from year to year, although unable to flower under short-day conditions, wild senna plants showed less adaptation; continuous short-day treatments not only prevent flowering but lead to conditions of dormancy and senility before sufficient reserves have been accumulated for growth in subsequent seasons.

These experiments have a practical bearing on interpretations of the behaviour of new plant introductions. It is evident that failure to flower, which in the past was usually attributed to unfavourable soil or temperature conditions, may be due to lengths of day unfavourable to flowering.

PENETRATION OF PETROLEUM OIL INTO PLANT TISSUE. — Some experiments carried out by J. M. GINSBURG on foliage injury resulting from summer oil sprays are published in the *Journal of Agricultural Research* (1931, No. 5). With a view to finding an oil that can safely be used in the orchard, refined petroleum oils (stained) of various viscosities were applied on the upper and lower surfaces of leaves of apple, peach and tomato plants, and the time taken for the oil to penetrate into the leaf tissue was observed. The same oils were also tested on apple twigs. The following conclusions are drawn from the results obtained:—

All the oils tested penetrated through the under surface of the leaf, presumably through the stomata, the rate of penetration varying indirectly with the viscosity of the oil. Only oils of low viscosity penetrated through the upper surface of the leaf.

Wherever oil penetrated into the leaf injury followed shortly after. Penetration of emulsified oils is much slower. The oils are absorbed and conducted by the vascular bundles of apple twigs, the rate of conduction varying indirectly with the viscosity of the oil.

The viscous oils either do not penetrate at all, or only to a very slight extent, through the outer cork of the twig.

Penetration of oil into leaf tissue as well as absorption into apple twigs vary directly with the concentration of the oil.

THE VITAMIN CONTENT OF SOME COMMON VEGETABLES. — An interesting study on the vitamin content of some common vegetables carried out by KOHMAN F. B., EDDY W. H. and CELIA ZALL GURIN is published in *Industrial and Engineering Chemistry*, Vol. 23, No. 7.

Canned turnip greens, head lettuce (inner and outer leaves), celery (bleached and

green) and raw carrots (whole and shredded for 1 to 3 hours before feeding) have been studied for their relative vitamin content.

Canned turnip greens, like other green leafy vegetables, are outstandingly rich in vitamin A, unsurpassed by any other vegetable and comparable to spinach; 25 mg. supply more vitamin A than 5 gm. of bleached celery and as 500 mg. of unbleached celery.

Canned turnip greens, head lettuce and celery are not rich sources of vitamin B. In view of the general belief that raw vegetables are always a potent source of vitamin C, head lettuce, celery and raw carrots were found to be surprisingly low in this factor compared with canned turnip greens.

D. K.

TROPICAL AND SUBTROPICAL AGRICULTURE

Notes.

DISCUSSIONS ON TROPICAL AGRICULTURE AT THE INTERNATIONAL INSTITUTE OF AGRICULTURE. — A meeting of the Bureau of the Commission for Tropical and Sub-Tropical Agriculture has just taken place at the International Institute of Agriculture. This Commission forms part of the International Scientific Agricultural Council, one of the chief of the consultative bodies attached to the Institute. The meeting was of particular importance not only as regards the problems of tropical agriculture raised but also in connection with the crisis now affecting the most important factors of tropical production.

Those present included: M. LEPLAE, Director General of Agriculture to the Colonial Ministry of Belgium, President, Sir Wyndham R. DUNSTAN (Great Britain), member of the 'Bureau de l'Association Scientifique Internationale d'Agriculture des Pays Chauds', etc.; M. FAUCHÈRE, Permanent Secretary to the 'Association Scientifique Internationale d'Agriculture des Pays Chauds'; Prof. Heim DE BALSAC (France); Prof. MAUGINI (Italy); Sir Arnold THEILER, Ex-Director of Veterinary Education and Research, Union of South Africa, Dr. LUTRARIO, President of the 'Commission du Paludisme', Paris; Dr. BISANTI, representative of the 'Office international des épizooties', Paris; etc. Members of the staff of the Institute and a number of observers were also present. The Bureau of the Commission held six meetings in which the items of a lengthy Agenda were discussed, and passed resolutions regarding methods of developing native agriculture, the cultivation of quinine, of rubber and of tannin-yielding plants, the investigation of osteomalacia. Certain lines to be followed in the Institute's work in tropical agriculture were laid down and the resolutions adopted by the recent Tropical Agricultural Congresses at Antwerp, Paris and Seville were also considered.

An important and interesting feature was the display of cinematograph films and lantern slides, illustrating the Italian Colonies, the Belgian Congo, the French Colonies and osteomalacia, shown and described by Profs. MAUGINI, LEPLAE, HEIM DE BALSAC and Sir A. THEILER, respectively. In accordance with the resolutions of the meeting the Permanent Committee of the Institute will make representations to the Governments concerned regarding the steps required for giving effect to the resolutions.

A detailed account of the discussions and work of the meeting will be published in a future number of the Monthly Bulletin of Agricultural Science and Practice.

AGRICULTURAL ENGINEERING

Notes.

RURAL WATER SUPPLY IN CZECHOSLOVAKIA. — In the country communes water has hitherto been obtained from wells, artificial reservoirs, streams or by simple methods of carrying spring or underground waters. These methods are not either hygienically or economically satisfactory. The communes have therefore undertaken the construction of aqueducts.

Conditions are favourable for building aqueducts because except in the archæan soils the geological systems are rich in good quality water. Spring water and underground

streams are tapped by digging wells and forming conduits and drains. Water containing excess of free CO_2 is deacidified in a marble filter. Excess of iron is also removed by filtering. The water is carried by its own natural flow or under pressure. All the pipes, reservoirs, etc. are built of cement or reinforced concrete.

The building of aqueducts is encouraged by a law promoting improvement in the water supply, which allows the authorities concerned to make themselves responsible for a proportional part of the interest on loans contracted to cover the approved costs. This law has set in progress 24 large aqueduct building schemes over the whole Republic, with an estimated expenditure of 300 million Czechoslovakian crowns (Václav TOPOL, *Zasobování venkovské vodou v Republice československé*, Prague, 1931, 26 p., illustr.; published by the Ministry of Agriculture of the Czechoslovakian Republic; in Czech, German and French).

POWER FARMING WEEK, ROME, 1932. — The Head of the Italian Government has decreed a 'Power Farming Week' to take place in Rome, 8-15 May, 1932. It is to be organised by the National Syndicate of Agricultural Engineers with the co-operation of the National Confederations concerned. Among the activities will be included the following:—

- (1) a National Power Farming Congress
- (2) an exhibition of farm implements and machinery
- (3) demonstrations of the working of various machines
- (4) lectures showing the technical importance and economic value of power farming, with special consideration of local conditions, given by a number of engineers in each province during the week

THE DEVELOPMENT OF POWER FARMING IN ITALY — In an article headed "La produzione ed il commercio mondiale delle macchine agricole" (*Italia Agricola*, Piacenza, 1931, pp. 507-523) Adolphe CARENA gives statistical data concerning the production of and trade in agricultural machinery in the principal countries of the world, with special consideration of Italy. Italy now imports annually about 150,000 quintals of agricultural implements and machinery, having a total value of 64 million liras, and exports only 6 000 quintals, with a value of 3.7 million liras.

The methods of developing the agricultural machine industry within the country are discussed. To make the suggested methods effective however, a close collaboration would be necessary between the machine industry and the agricultural engineering research institutions, by means of a central organisation to allow of the production of types of machinery adapted to the conditions and requirements of Italy.

COMBINE HARVESTER-THRASHERS. — The American combine, its use, its parts and their care are described by P. DIFFLOTH in *La Vie Agricole et Rurale* (Paris 1931, No. 33, pp. 97-100).

NEW TYPES OF COMBINE ADAPTED TO EUROPEAN CONDITIONS. — After many years' experiments two farm machinery firms have developed independently a combine suited to Central European conditions.

The 'Deutsche Industrie-Werke' have based their machine on the 'Leege' binder for lodged grain. Between cutting and binding is introduced an ordinary drum and concave thrasher and a simple winnower; the grain is bagged and the straw bound after thrashing. It is also possible in case of bad weather to eliminate the thrashing and allow the machine to function as a simple reaper-binder. The machine is small in comparison with American combines, being the size of an ordinary binder. No new features have been introduced, and the results being satisfactory it seems unlikely that difficulties will be met with in the final development of the machine.

The 'Gebrüder Claas' combine, on the other hand, which has been developed in collaboration with the 'Reichskuratorium für Technik in der Landwirtschaft' (German Agricultural Engineering Council), is based on entirely new ideas. It offers a number of new technical problems and it is therefore too soon to say whether it will need modification before it reaches its final form. The cut grain is carried in a uniform layer on a conveyor to a vertical thrasher into which only the heads pass. Further discussion of the machine will be reserved until more particulars are available.

ANIMAL HUSBANDRY

Problems and Methods of Breeding Lard Pigs (1).

There has been a considerable change in pig farming in Hungary since the war. Farmers are taking more and more to the raising of meat breeds such as Yorkshire pigs, selected German breeds and Berkshires. Although even before the war these breeds were being successfully raised in Hungary they were of secondary importance in comparison with the fat Mangalicza pigs. The following figures however show recent developments. - in 1925 5.5 % of the swine belonged to the meat breeds, in 1930 12.6 % and in 1931 14.8 %.

But there is no occasion to conclude from these figures that the Mangalicza breed is losing its importance. Although it is considered desirable that the meat breeds should be raised wherever conditions are favourable and should be encouraged in every way possible, there is no doubt that the fat pig will remain of premier importance. The extreme climate, the pasture which forms the basis of Hungarian pig raising, the utilisation of stubble, the extensive system of pig farming as compared with that of Western Europe, all these factors ensure the future of this excellent fattening breed. Even if in recent years economic changes and the difficulty in finding markets have caused a reduction in the breed, the reduced numbers are compensated for by the improved quality. The National Society of Mangalicza Breeders, which was formed in 1927, has improved breeding methods, spread the principle of breeding for special purposes, instituted herdbooks and in other ways promoted the improvement and standardisation of the Mangalicza breed in all countries.

The fact that 2/3 of the dead weight is made up of fat (lard, internal and external fat, etc.), and only 1/3 of bone and meat clearly shows the pronounced aptitude of the breed for fattening. The official dressing tests at the Budapest Fat Pig Shows have given even more striking results, e. g., a castrated male of 18 months weighing 197 kg had a dead weight (exclusive of lungs, heart, kidneys, brain, liver and intestines) of 180 kg; thus the slaughterhouse waste was only 17 kg, corresponding to 8.6 % of the live weight; 24.73 % of the dead weight was formed of bone and meat and 75.27 % of fat. Another 2-year-old castrated male weighing 254 kg had a dead weight of 235 kg, the loss thus being 19 kg, corresponding to 7.4 % of the live weight; 25.6 % of the dead weight was formed of bone and meat and 74.32 % of fat.

The importance of the pig fattening industry is shown by the following figures. In 1913 in the public abattoirs 1.5 million fat pigs were slaughtered; from 1926 to 1930 the yearly average was 1.2 million. In 1913 500,000 pigs were sold on the market at Budapest, and at Vienna 400,000 fat pigs from Hungary. From 1910 to 1914 there was an annual export of 445,800 fat pigs, having a value of 100 million gold crowns, and 95,000 quintals of fat, with a value of 14 million gold crowns. The estimated consumption of fat in Hungary is 9.4 kg per head. The fat requirements are 75 to 80 million kg. The consumption of porkflesh is 8.3 kg per head.

(1) In this *Bulletin*, 1931, No. 6, was published a short summary of present tendencies in European pig production in which it was shown that the raising of pigs for meat is spreading into regions of Europe which formerly bred only fat or lard breeds. The economic conditions which have brought about this development have caused difficulties in the fat pig industry. In this article Prof. RACZ of the Agricultural Academy of Debrecen (Hungary) discusses the improvements necessary in fat pig breeding in South Eastern Europe to maintain this profitable industry. (Ed.).

Breeding methods. — The methods and conditions of breeding Mangalicza pigs are entirely different from those of Western European pig farming. The Western breeds, even in Hungary, are generally kept on the farm itself, using good housing, excellent pasture, fields of clover and lucerne and the principles of scientific feeding. The raising of Mangalicza pigs is based mainly on the utilisation of extensive grazing on estates and common lands, of root and potato tops and other occasional grazing. Throughout almost the whole year the Mangalicza herd is in the open all day, returning to shelters or pig houses only at night. The herd sometimes remains outside, far from the homestead, from spring to autumn, only the brood sows being fetched back for farrowing.

This system produces the hardiness and resistance of the Mangalicza breed. It is *par excellence* a "range" pig, its breeding being governed only by the extent and quality of the grazing, as is also its feeding. Farms which have at their disposal wide areas of good pasture have no need to resort to supplementary foodstuffs during the grazing season as must farms having insufficient pasture. The aim of the Mangalicza breeder is to produce well-grown, but not fat, animals ready at a year or 18 months for the fattening industry.

From the point of view of quality the large farms and estates which produce good pure-bred animals, are the most important. On the large farms the number of sows averages 100 to 200, though several have a larger stock. These uniform herds are preferred in general to the mixed lots of pigs of lower quality and value produced by the small farmers.

The Mangalicza is a medium-maturing breed, the pigs being ready for breeding at 15 to 18 months, when the sows weigh 80 to 100 kg. Breeding herds number from 50 to 100 sows. During the breeding season of 3 weeks 1 boar is added to the herd for every 8 or 10 sows. Many farms have a herd in which controlled breeding is practised.

The small farmer with one or two sows keeps them in the common herds where they are bred by the common boars. Legislation provides for an adequate supply of good quality boars. In the common herds there is 1 boar for 25 to 40 sows, breeding taking place all the year round.

Under the extensive system there is one litter a year; now there are 3 in 2 years or even 2 litters a year on most of the intensive farms where the sows are well-fed and capable of supporting as many. On these farms the first farrowing is from December to February, the second from June to August; the winter litters can be put out to graze immediately after weaning, which greatly encourages their growth and the summer litters are strong enough to stand the winter in the pig houses. This is naturally not a general rule for it depends on economic conditions, breeding methods, etc.

Sows are generally kept 5 to 6 years, boars 4 to 5 years. On many farms a quarter of the herd is replaced every year by young stock.

The age of weaning varies; it is generally at 8 weeks, but where there is only one litter a year, or if breeding stock is being raised, it may be from 10 to 11 weeks. On small farms weaning is even earlier.

The young pigs from the third week are fed barley or other grains, bran and sometimes even protein-rich feeds. While still sucking a pig generally receives 10 to 20 kg of feed. During weaning the pigs are inoculated against swine measles by the Pasteur method and the males are castrated. Breeders hold that early castration is better and produces a finer constitution. In certain farms however castration is not carried out until the pigs are 5 or 6 months old.

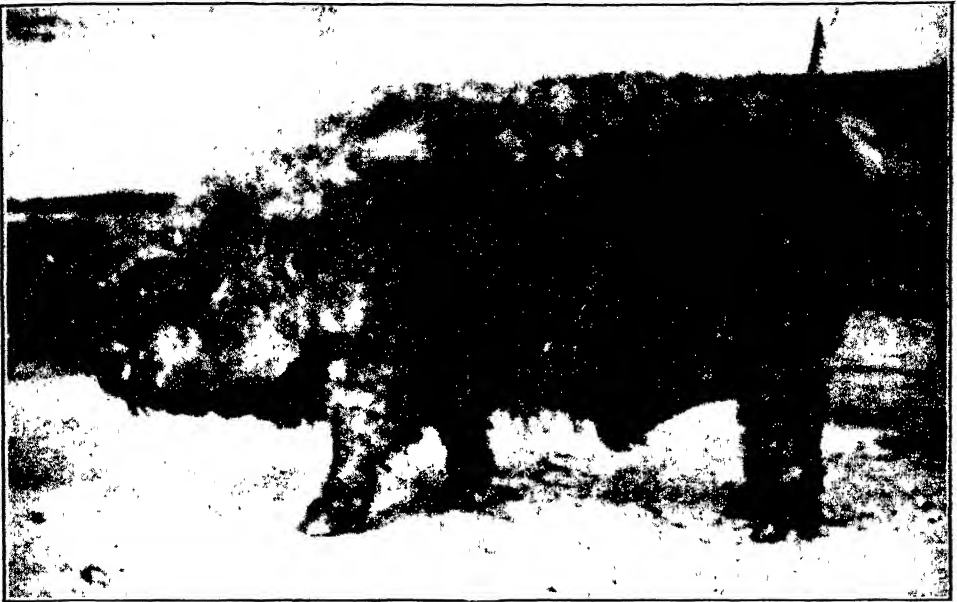


FIG. 1. — Mangalica Boar of 2 $\frac{1}{2}$ years.



FIG. 2. — Mangalica Sow of 1 $\frac{1}{2}$ year.

The writer's experiments on the best time for castration from the point of view of growth have given the following results :—

(1) With late castration the animals are larger and heavier than others of the same age in the same herd, similarly fed, but castrated earlier ;

(2) The age of 7 to 9 months is the most favourable for castration from the standpoint of the animal's growth ;

(3) Animals castrated at this age weigh at least 10 % more than those castrated at weaning.

The feeding of weaned pigs is continued with barley and other grain. They are fed 0.8 to 1 kg of concentrates per head daily in addition to grazing. Often they receive a daily ration of as much as 1 or 2 kg of green fodder (lucerne) per head. A well-grown animal weighs 20 to 25 kg at 4 months.

Sows intended for fattening are castrated at 4 or 5 months. According to the research of LASZLO ovariectomy at this age is advisable for the following reasons :—

(1) Sows castrated at 4 months later exceed in weight sows castrated at 1 year or 18 months by 10 %.

(2) If non-castrated sows are fattened they come into heat 10 times (every 20 days) during the fattening period of 200 days, lose about 10 kg in weight and disturb the others.

Losses in weight of non-castrated animals during the whole fattening period are as much as 18 to 20 kg. But the writer's studies of the subject show that ovariectomy carried out at the age of 4 months instead of waiting until 7 or 9 months produces a gain of 10 %.

At the age of 4 or 5 months the pigs are inoculated against swine fever by the HUTYRA-KOVES method. Between the age of 5 months and 1-1½ years the pigs mainly find their own food. The herds remain in the open from the spring until the first snows. A supplementary ration of various grains, bran, legumes and cake is fed. Often potatoes and mangolds are also given. The supplementary feeds depend on the quality of the grazing. In winter if the grazing is poor the pigs are fed an extra daily ration of 1 to 1.5 kg per head. On certain farms during December, January and February 2 kg are given. On the other hand, after the second week of harvest, from the end of June to the end of July and even until mid-August, when the pigs are put on to the stubble they are given no supplementary rations, except 0.5 kg during the second half of the period.

The utilisation of the tops of root crops begins towards the middle of September and lasts until mid-November or later. During this time the pigs receive 0.5 to 1 kg of feed per head daily. A gain in weight during this time of 5 to 6 kg per month is considered satisfactory and the average weight of the pigs is 60 to 70 kg. The animals are well-grown but lean. The average quantity of concentrated feeds or fodders consumed by one pig varies between 200 or 250 kg. Care is of course taken that sufficient minerals are also supplied.

The breeding stock, particularly the boars, are fed a richer ration consisting mainly of oats, barley and sometimes a little bran. At 15 to 18 months well-grown boars weigh from 110 to 120 kg ; they consume 450 to 500 kg of feed per year.

This young stock supplies the fattening industry. Every small farmer and even every agricultural labourer fattens one sow to produce his annual requirements of fat. This uncontrolled slaughter is not included in the official records, which therefore do not give an accurate idea of the extent of the industry in Hungary.

Fattening takes place either in special fattening stations or on the farm. A number of farms, particularly those well situated as regards transport, undertake

the fattening of their own animals. There are also farms which buy extra pigs for fattening, thus undertaking the risks both of breeding and fattening.

The methods of fattening on the farms are not standardised as in the industrial fattening stations and depend largely on local conditions. The basic feed is always maize, but other crops raised on the farm are used, such as potatoes, sugar beet, second grade wheat, rye, barley, millet, bran, legumes, cattle cakes, etc. The feeds are graded so as to supply more protein during the first half of the fattening period in order to promote the formation of meat.

Formerly the fattening industry was centralised in specialised establishments which produced the highest quality products owing to their excellent equipment and organisation. Now fattening is being increasingly undertaken on the farms and the products are able to compete as regards quality with those of the special fattening stations.

The fattening industry requires lean animals of 1 year to 18 months weighing 60 to 75 kg, well developed, uniform in type, firm boned, inoculated and castrated. They are fed barley and maize, the latter making up $\frac{2}{3}$ of the ration, during the whole period. At the beginning they are often given bran as well.

Fattening is carried out in sheds open on one side. A fattening season lasts 5 to 6 months. During this time 5 to 5.5 quintals of bruised grain are used per animal, which gives a gain in live weight of 18 to 20 % of the feed consumed. For example, a pig of 70 kg consuming 550 kg of bruised barley and maize utilising 20 % of the feed reaches, by the end of the fattening period, a weight of 180 kg. The proportion of feed utilised depends on the capacity of the animal for transforming feed into live weight and determines the success of fattening. After successful fattening a pair of young pigs weighs usually 350 to 400 kg.

Old breeding stock, both boars and sows, are also fattened after castration. These give a finished weight of 400 to 450 kg per pair and the meat is utilised by the curing industry.

Improvement of the breed. — As has already been stated there is room for improvement in the fecundity and the age of maturing of the Mangalica pigs.

It is a medium-maturing breed. There are from 2 to 13 young in a litter, the average being 6. The fact that amongst the sows entered in the herd book of the breed 25 % had a litter of 7, 10 % had 8 and 4 % over 8 shows that improvement is possible in this direction.

The writer's studies of the question show that fecundity is correlated with age and the number of farrowings and is also in direct ratio with the number of teats. Sows with 12 teats are 30 % more prolific than those with ten.

The writer is able to state from his own investigations that :—

(1) in pure-bred Mangalica sows the number of teats varies between 10 and 12 with an occasional higher number ;

(2) the position of the 6th pair of teats varies.

In crossbreds from Mangalica sows and German improved boars the number of teats is increased by 10.12, in purebred Mangalicas by 10.58.

As regards fecundity it is shown that :—

(1) the average number of young in the first litter is low ;

(2) the number increases with the number of farrowings ;

(3) the third litter is the largest ;

(4) from the 4th year the litter diminishes rapidly.

There is considerable variation in the number of pigs weaned, the weight at

different ages, the total weight of the litter and the uniformity of litters. There is thus plenty of scope for selection.

Amongst the animals tested from 1928 to 1930 by the Society of Mangalica Breeders 60 % of the sows weaned 6 young and 20 % weaned 7 or more. Thus with scientific selection a standard of quality should be required of the Mangalica sow of at least 7 to the litter.

The variation in weight of the litters and young is even more striking. For instance the weight 24 hours after birth varies between 0.70 and 2 kg, and of the whole litter between 1 and 18 kg.

The weight at 4 weeks old varies between 2 and 8 kg, that of the litter between 10 and 65 kg. At 8 weeks the pigs weigh 4 to 17 kg, the litter 10 to 105 kg. Weaned pigs weigh 5 to 21 kg; the litter at the same age 15 to 135 kg.

The following table shows the variation in the capacity of Mangalica sows to rear their young, from data obtained by the observation of 13,212 litters.

	Number of litters examined	Index of variation	Average number of young per litter	Mean weight of litter in kg
			From herdbook figures	
Research on the number of young	3,133	± 1.3789	6.187	—
1) at birth	2,712	± 2.541	—	9.141
2) at 28 days	2,903	± 1.552	—	30.295
3) at 56 days	2,575	± 2.729	—	55.520
4) at weaning	1,889	± 3.709	—	65.690

The wide variation of the Mangalica breed in this particular is related to the remarkable differences in the milk yield of the sows. In 7 sows the milk production varied between 119.31 and 190.55 kg during a period of 62 to 75 days. The composition of the milk of the best sow as regards milk yield and capacity to rear young was as follows:— density (at 15°C) 1.0476, dry matter 21.80 %, fat 7.60 %; dry matter non-fat 14.20 %, nitrogenous matter (N = 6.37) 8.89 %, lactose 13.64 %, ash 1.68 %, phosphoric anhydride (P₂O₅) in the milk 0.552 %, in the ash 33.07 %, CaO in the milk 0.666 %, in the ash 39.91 %.

Studies of the milk production of the Mangalica breed have shown that:—

- (1) In the first 7 or 8 weeks the yield is uniform, then it rapidly diminishes.
- (2) The sow gives 43 % of the total production in the first 28 days, 70 % in 42 days and 87 % in 56 days.
- (3) There is close correlation between the weight of the litter and the milk production; there is a still more evident relation, specially in the first 4 weeks, between the weight of the young pigs and the quantity of milk consumed.
- (4) If the teats give an equal yield of milk the pigs develop uniformly; if the production of the different teats varies much the litter lacks uniformity.
- (5) When the sow has 5 pairs of teats the 3rd pair, counted from before backwards (the 4th pair phylogenetically), often gives more milk than the others. This difference may reach as much as 16.5 kg; but the maximum production in the 4th pair is not a general rule.
- (6) In the first 4 days the litter gains 700 to 800 gm per day; in the 3rd and the 4th weeks 650 to 700 gm; in the 8th and 9th weeks 800 to 1500 gm.
- (7) In the first 4 weeks 2.3 to 3.7 kg of milk are required to produce 1 kg gain of live weight per pig.

(8) In a 9 week period a poor quality pig weighing 8.5 kg at weaning has consumed in round figures 20 kg of milk ; in the same period a pig weighing 13 kg at weaning has consumed 30 kg of milk.

(9) The milk production of a sow increases with the number of farrowings. The writer's work on the correlation between the weight of a litter and the number of young has shown that with Mangaliczas heavy weights at birth, at 4 weeks, at 8 weeks and at weaning are obtained with 7 pigs to the litter.

The larger number of sows thus prolific ensures the success of selection in this direction, so that breeders following scientific methods may hope to obtain herds giving an average of 7 to the litter.

Before the war certain breeders endeavoured to improve the fecundity and accelerate maturing of Mangalicza pigs by cross-breeding with Lincolnshires. But although the results of crossing with this excellent English breed were satisfactory the crossbreds have not been able to spread owing to the desire of even the large breeders to keep the blood of the Mangalicza pure and to maintain the heavy pigmentation of the skin.

To increase the fecundity of the Mangaliczas it is not necessary to cross with other breeds for the pure breed already possesses the tendency to improvement up to the limits set by the possibilities of rearing.

Earlier maturing as well as increased fecundity is of importance. As a result of their slow growth and the 5 or 6 months required for fattening the pigs are not marketed until they are 18 months or 2 years old. Certain farms have attempted to avoid this drawback by feeding richer food and thus utilising more fully the energy of growth and terminating fattening more rapidly. On these farms it has been found possible to market fat pigs weighing 340 to 350 kg per pair at the age of 14 to 16 months.

Studies of growth with richer feeding, particularly of protein, have shown that pure-bred Mangalicza pigs are definitely capable of profiting from it. Pure-bred Mangaliczas of a satisfactory weight at weaning have, moreover, when thus fed given results similar to the Lincoln \times Mangalicza crossbreds. For instance, a young lard pig weighed 86 kg at the age of 6 to 7 months ; another weighed 95 kg at 8.5 months and, after a period of fattening, 164 kg at 11 months, giving a final utilisation of the feed of 21.5 % (KONKOLY-THÉGE and POHL).

To improve the maturing age cross-breeding is sometimes effected with Berkshires and Cornwalls. The crossbreds are utilised only for fattening, never for breeding. They grow better than the pure breed if well fed, and fattening can be begun earlier and is more rapid.

According to observations of certain experts the Berkshire and Mangalicza crossbreds weigh even at weaning 4 to 5 kg more than purebred pigs ; at 1 year they reach 75 kg, while the Mangaliczas weigh only 60 kg. At 1 year old, after fattening for 6 months, the crossbreds weigh 360 to 400 kg per pair, but they are sometimes fed for porkflesh by beginning fattening at 4 or 5 months and continuing it for 4 months. The fecundity of these crossbreds exceeds that of the pure breed by 20 %.

The writer can state from his experience of Berkshire \times Mangalicza crossbreds that :—

(1) The crossbred pigs at weaning weigh 10 % more than purebred Mangaliczas ; at 1 year the difference is increased to 15 %.

(2) Fully grown pigs at 13 months can reach finished fat at 16.5 or 17 months (weighing 380 kg per pair) ; but the earlier difference in weight of 15 % falls to 5 % by the end of the fattening period.

(3) Purebred Mangaliczas are preferred on the market owing to their better distribution of fat and lean.

(4) Purebreds to compete with the crossbreds must be heavy at weaning and well fed after.

Small breeders in different parts of the country sometimes cross Mangaliczas with Yorkshires. The crossbreds are marketed, according to the intensity of feeding, at 65-75 kg for curing for ham, or at 90 to 110 kg for the bacon industry. These crossbreds are never used as lard or fat pigs.

The successful activity of the Society of Mangalicza Breeders and the institution of herdbooks have improved the breed and the figures show that progress is continuous. The following is a summary of the results of the first three years' activity of the Herdbooks Committee as regards the qualities of the breed :—

(1) From 1928 to 1930 the fecundity of the pigs entered in the herdbooks has increased from 5.9 to 6.3, although in 1930 the number of sows entered was about 50 % higher.

(2) With increased fecundity the weight of the litters has increased. In 1928 the weight at weaning of 3165 pigs entered in the herdbooks was 10.9 kg ; in 1930 the weight at weaning of 5252 pigs examined was 12 kg.

(3) There has also been an increase in the weight of the litters at birth, at 28 days, at 56 days and at weaning. The weight of a litter at birth has increased from 8.66 to 8.89 kg ; at 28 days from 30.4 to 31.3 kg ; at 56 days from 55.4 to 58.2 kg. ; at weaning from 60.7 to 68.8 kg. It should be noted that the 1930 figures were obtained from a greatly increased number of animals.

(4) There has been a considerable increase in the percentage of sows farrowing litters of a weight above the average and the standard required by the Society.

The Society of Mangalicza Breeders is making an effort to increase the fattening capacity and the ability to utilise feed. With this aim in view a selection of the pigs showing these qualities in most marked degree is being carried out to start strains to transmit the desired qualities.

The recent law for the standardisation of fat to promote the breeding of fat pigs. — Mention must be made in conclusion of the legislative measures taken by the Ministry of Agriculture to standardise the official marking of fat, in order to protect the reputation of Hungarian pig fat and increase exportation.

These regulations provide that the mark shall be applied only to fats having the colour of natural white fat, a maximum water content of 0.3 %, a trace only (0.2 %) of muscular tissue and a maximum acidity of 1.5 %. According to official instructions the fat must be packed in boxes or barrels ; it must be fresh, sound, odourless, formed of natural raw fat, without addition of foreign matter, prepared in specially installed establishments or in establishments approved by the National Export Institute. The exportation of marked fat is allowed only to establishments authorised to apply the national mark or provided with an exportation permit issued by the National Export Institute.

During the first year following the institution of the national mark the mark was applied to 3,745,735 kg of fat, 366 carloads of which were exported. In 1928 however only 171 carloads were exported, in 1929 only 129. Complaints about the quality of Hungarian fat have completely ceased since the establishment of the marking system ; the measure has even had a noticeably favourable effect on the fat pig breeding industry.

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Recent Studies on the Theory and Practice of Fat Lamb Production.

The fall in wool prices during recent years has been the cause of considerable changes in intensive sheep farming. Changes are evident in breeding practice, management, feeding and utilisation, in recognition of the fact that to-day it is the general purpose sheep that is gaining importance in intensive farming regions. Meat production and in particular fat lamb production are increasing and in many cases represent the only remunerative opening for the sheep farmer. A new development along these lines is to be seen in the fattening of lambs before weaning for slaughter at 4 to 5 months.

Reports on this new branch of production are on the whole favourable and Prof. GOLF is even of the opinion that the main revenue of sheep farming in Germany at the present day is obtained from meat production in the form of fat lambs.

The product finds a ready market. The type depends on the demand and varies in different localities; on certain markets there is a demand for lambs of 32 to 35 kg., on others 40 to 45 kg are preferred. M. H. L. THILO, the well-known German expert, has attempted to find a remedy for this difficult situation of uncertainty for the farmer by establishing a standard type. His "standard" is a fine lamb weighing 65 to 75 lbs when finished fat at 4 to 5 months and having consumed 75 lbs of concentrates and 25 lbs of dried beet cossettes and valued at 40 Marks per head. This standard type should be characterised by a special mark and in collaboration with farming and commercial interests this result has been achieved by M. THILO. Fat lambs are priced according to dead weight which is to the advantage of the farmer.

The economic importance of the fattening of lambs is based also on physiological factors. Lambs have great vigour of growth and a remarkable capacity for the utilisation of food, exceeding even that of calves. SCHANDL quotes in proof of this the figures obtained by WIERTELEVSZKY, according to which to produce a gain in live weight of 1 kg calves require 340 gm of available protein and 1560 gm of starch equivalent, whereas lambs require only 283 gm of available protein and 1185 gm of starch equivalent. This fact is particularly noteworthy in view of the fact that the food requirement per 100 kg gain in adult sheep is considerably greater than in cattle of the same age.

These new tendencies in sheep farming are similar to those in pig farming, as set forth in another number of this Bulletin (1). With sheep as with pigs the present tendency is to produce young fat animals instead of fattening older animals, and the same advantages are obtained of improved meat quality, better utilisation of feed and consequent more profitable fattening and more rapid circulation of capital.

Position of lamb fattening on the farm. — As in the case of pigs, two methods of fattening lambs can be distinguished: — normal fattening (*Wirtschaftsmast*) and rapid fattening (*Schnellmast*).

Normal fattening is usually practised with the less early maturing breeds, particularly when lambing is at the end of winter (January and February). These lambs are for the most part put out to graze, fed supplementary concentrates and will be marketed after utilising the fields of roots and potatoes in autumn, when they

(1) See, 'Present Tendencies in European Pig Production', *Monthly Bulletin of Agricultural Science and Practice*, 1931, No. 6, pp. 225-233.

have reached a live weight of 50 to 55 kg, or else they will be given a short period of final fattening before sale.

In the early flocks in which lambing took place from the end of October to early in December the rapid method of fattening seems the more practised. In this case the lambs are fattened to come on the market in spring with the fresh vegetables, when the young meat is most in demand. With the rapid fattening method, according to the experts GOLF, LEROY, FRÖHLICH and LÜTHGE, the lambs can obtain the following weights: —

Weight at weaning	4-5 kg	Weight at 3 months	26-28 kg
" " 1 month	8-10 "	" " 4 "	32-35 "
" " 2 "	18-20 "	" " 5 "	36-40 "

There are two methods of rapid fattening, of sucking and of weaned lambs. By the former method the lambs remain with their mothers for the whole period, and the ewes are fed so as to promote milk production and prevent loss of weight. By the other method the lambs are weaned much earlier and the ewes require less feed. As a result of his own experiments and those of EBBINGHAUS, FRÖHLICH considers that with too early weaning there is risk of checking the growth of lambs. He regards this as the cause of the varying results obtained with this method.

Research on the theory of fattening lambs. — Very few exact figures regarding the feed requirements of lambs for fattening can be found in past literature. At the time when KELLNER established his valuable rationing rules the intensive fattening of lambs was not practised, which accounts for the fact that there is no information on this matter in his work. This gap has been filled recently by a number of workers.

The following table gives the recently published results obtained by FRÖHLICH and LÜTHGE at the Zootechnical Institute of Halle University, Germany.

TABLE I. — *Feed requirements of growing lambs.*

Age	3 weeks		4 weeks		5 weeks		8 weeks		10 weeks		12 weeks	
Live weight (in kg)	9.2		10.8		14.0		17.2		20.4		23.6	
Feed requirements in	Available protein	Starch equivalent	Available protein	Starch equivalent	Available protein	Starch equivalent	Available protein	Starch equivalent	Available protein	Starch equivalent	Available protein	Starch equivalent
in the feed (gm)	—	—	10	75	20	150	35	200	60	300	90	400
in the milk (gm)	65	326	50	230	43	225	35	175	27	150	27	145
Total (gm)	65	326	60	305	63	375	70	375	87	450	117	545
Age			14 weeks		16 weeks		18 weeks		22 weeks		26 weeks	
Live weight in kg			26.8		30.0		33.2		39.6		46.0	
Feed requirements in			Available protein	Starch equivalent	Available protein	Starch equivalent	Available protein	Starch equivalent	Available protein	Starch equivalent	Available protein	Starch equivalent
in the feed (gm)			110	450	160	650	180	700	200	800	220	850
in the milk (gm)			23	135	—	—	—	—	—	—	—	—
Total (gm)			133	585	160	650	180	700	200	800	220	850

Based on these figures FRÖHLICH and LÜTHGE recommend for fattening lambs the rations indicated in Table II :

TABLE II. — *Rations for fattening lambs.*

Age	Available protein	Starch equivalent
1 month	5 grammes	50 grammes
2 "	40 "	200 "
3 "	100 "	425 "
4 "	175 "	700 "
5 "	200 "	800 "
6 "	220 "	850 "

Table III shows, according to the figures of the same writers, the quantities of the food principles that lambs of different weights must receive in the feed and in the ewe's milk to gain 1 kg in live weight.

TABLE III. — *Quantity of nutritive principles required to produce a gain of 1 kg in fat lambs.*

Weight of lambs	In the ewe's milk		In the feed		Total	
	Available protein	Starch equivalent	Available protein	Starch equivalent	Available protein	Starch equivalent
15 kg	174 gm	870 gm	180 gm	970 gm	354 gm	1840 gm
16-17 "	165 "	826 "	190 "	1030 "	355 "	1856 "
21-24 "	117 "	640 "	310 "	1540 "	427 "	2108 "
37-40 "	—	—	700-730 "	2400-2800 "	700-730 "	2400-2800 "

The French expert LEROY has expressed the results of his experiments in fodder units (quantity of net energy utilisable by the animal contained in 1 kg of mixed grain). He recommends the rations shown in Table IV.

TABLE IV. — *Rations recommended by M. LEROY.*

Period	Mean weight	Grain	Fodder units of the essential ration	Fodder units of the supplementary ration		Fodder units of the ration of ewe's milk	
				absolute value	in % of total theoretical requirements	absolute value	in % of total theoretical requirements
From birth to 2 months	10 kg	220 g	0.57	0	0	0.57	100
From 2 to 3 months . . .	22 "	800 "	0.86	0.14	16.3	0.72	82.7
" 3 " 4 "	31 "	300 "	0.97	0.35	36	0.62	64
" 4 " 4.5 "	38 "	280 "	1.02	0.96	95	—	—

As regards the protein requirements per kg of live weight M. LEROY gives the following figures, calculated from the data of WOLF, WEISKE, BULL, EMETT :—

From birth to weaning, 4 to 4.5 gm — at 5 months, 3.2 gm — at 7 months, 2.7 gm — at 9 months, 2.3 gm.

Amongst recent work on feeding of lambs that of Prof. MAYMONE which is based on the energy values of ARMSBY gives the following figures obtained by the graphic method of LEROY.

TABLE V. — *Energy value and protein requirement of maintenance and production rations to give a daily gain of 100 gm per lamb.*

Live weight	Energy value of the ration expressed in calories	Starch value of the ration	Fodder value of the ration (in fodder units)	Requirement in available protein (in gm)
10 kg	5.040	0.25	0.36	55
15 "	6.765	0.28	0.41	70
20 "	8.085	0.34	0.49	80
25 "	9.240	0.39	0.56	85
30 "	10.560	0.44	0.64	90
35 "	11.715	0.49	0.71	90
40 "	13.035	0.55	0.79	85
45 "	14.025	0.59	0.85	85
50 "	15.180	0.64	0.92	80
55 "	16.170	0.68	0.98	80
60 "	17.160	0.72	1.04	75

To obtain a daily gain in live weight of over 100 gm it is necessary to increase the ration by 0.08 fodder units per 50 gm gain.

Table VI shows the method of using Prof. MAYMONE's data.

TABLE VI. — *Determination of the food requirements of a lamb of 3 months weighing 20 kg and gaining 250 gm per day.*

	Fodder units	Nitrogenous matter in gms
(1) Energy requirement for maintenance and to produce a daily gain of 100 gm	0.40	—
(2) Supplement for gain of over 100 gm $\cdot 0.08 \times 3$	0.24	—
(3) Nitrogen requirement for 20 kg of live weight	—	80
Total	0.73	80

RICHTER and his collaborators at the Prussian Zootechnical Institute of Tschechnitz are investigating the rations for Merino meat lambs weighing 30 to 40 kg per head. A preliminary report has been published, but the results cannot be regarded as conclusive owing to the small number of animals in the experiments. Their preliminary results give a fattening ration for Merino lambs weighing 30 to 40 kg of 0.38 kg of available protein and 1.8 to 1.9 kg of starch equivalent daily per 100 kg of live weight. The dressing percentage and lean-fat ratio obtained have justified this ration. It should be added however that the daily gain was only 184 gm, which is low in comparison with the results of other workers and the general requirement for daily gains of 210 to 250 gm per head.

In considering recent research on lamb fattening the work of HÜNERSDORFF and his collaborators and of JANTZON must be mentioned.

JANTZON has determined only the feed requirements and daily gain of growing lambs and gives no information about rations.

The following figures were obtained by HÜNERSDORFF and his coworkers.

TABLE VII. — *Schedule of rations for fattening lambs.*

Age of lambs	Available protein	Starch equivalent
4 weeks	15.2 gm	86 gm
6 "	25.6 "	174 "
8 "	40.6 "	252 "
10 "	47.5 "	297 "
12 "	55.8 "	356 "
14 "	89.7 "	470 "
16 "	121.6 "	578 "
18 "	154.6 "	677 "
20 "	178.3 "	728 "

HÜNERSDORFF with this system of rations obtained a daily gain of 236.7 gm per lamb.

The protein-starch equivalent ratio is much higher in this system than in that of FRÖHLICH and LÜTHGE.

A comparison of the figures given by different writers shows a considerable amount of variation. In spite of this however modern theories are a useful guide to the breeder and considering the progress of recent years in this field it may be hoped that the necessary data will shortly be at hand to enable exact rationing tables to be drawn up.

A problem closely related to that of the fattening of sucking lambs is the feeding of ewes during lactation. But although this question is very important for the successful fattening of the lambs, the theory on which it is based is not recent and it will suffice here to give a résumé of the results of some recent work on the subject.

As close comparison as is possible of the different results shows that those of FRÖHLICH and LÜTHGE, which are based on exact experiment, give surprisingly low figures. FRÖHLICH states in his report that the ewes lost a little weight, probably in consequence of the starch equivalent being slightly inadequate. He is however entirely right in considering that in well-fed ewes a slight loss of weight is of no importance, since it will be rapidly made up on the spring pasture. There are on the other hand wastage of feed and lower returns if ewes put on weight during the winter under cover. Too much economy of protein, on the other hand, is bad policy because a shortage of nitrogenous matter will cause a reduction in milk yield and thus check the development of the lambs.

The practice of lamb fattening. — These theoretical considerations will now be followed up by giving examples drawn from lamb fattening practice. It goes without saying that the data given make no pretention of being complete. The following notes which furnish only basic figures are drawn from the writings of recognised zootechnical experts.

TABLE VIII. — *Data for the rationing of mother ewes based on recent work.*

	Weight	FRÖHLICH & LÜTHGE		GOLF		NILS HANSSON	
		Available protein	Starch equivalent	Available protein	Starch equivalent	Available protein	Starch equivalent
Maintenance ration	50	50	415	—	—	45.0	—
	55	—	—	60	500	—	—
	60	60	500	—	—	—	—
Ewes with 1 lamb . .	50	105	665	—	—	105	665
	55	—	—	120	800	—	—
	60	115	750	—	—	—	—
with 1.5 lamb . . .	50	115	750	—	—	—	—
	60	125	830	—	—	—	—
	50	145	815	—	—	—	—
" 2 "	55	—	—	160	1000	—	—
	60	155	900	—	—	—	—

		KELLNER, FINGERLING		MAYMONE		LEROY	
		Available protein	Starch equivalent	Available protein	Starch equivalent	Available protein	Starch equivalent
Maintenance ration . .	50	415	—	—	—	—	—
	60	500	—	—	—	36	—
	—	—	—	—	—	—	—
Ewes with 1 lamb . .	—	—	{ 100-110 1)	710-852	Maintenance ration + 100 gr. per litre of milk produced	708.8	
	—	—	{ 120-140 2)	887.5-940			
	—	—	—	—			
with 1.5 lamb.	—	—	—	—	In general — Maintenance ration of ewe + maintenance ration of lamb + 0.5 per litre of milk produced.		
	—	—	—	—			
	—	—	—	—			
" 2 "	—	—	—	—			
	—	—	—	—			
	—	—	—	—			

In his work the writer indicates the *fodder units*, but to facilitate comparison they have been converted into starch equivalent by the equation 1 FU = 0.71 starch equivalent.

(1) Ewe of small breed (35 to 50 kg).

(2) Ewe of large breed (50 to 80 kg).

TABLE IX. — *Rations for fattening lambs, after H. L. THILO.*

Period		The daily ration contains (in kg)					Food consumed during the period (in kg)			
Month	Half month	Ewe's milk	Oats	Dried beet cossettes	Protein mixture	Hay	Oats	Dried beet cossettes	Protein mixture	Hay
1st . . .	1st	Milk	—	—	—	—	—	—	—	—
	2nd	"	1/20	—	—	—	0.75	—	—	—
2nd . . .	1st	"	1/8	—	—	1/20	2.0	—	—	—
	2nd	"	1/6	1/20	—	1/8	2.5	0.75	—	2
3rd . . .	1st	"	1/6	1/8	1/10	1/4	2.5	2.0	1.5	4
	2nd	"	1/6	1/8	1/8	1/3	2.5	2.0	2.0	5
4th . . .	1st	"	1/6	1/6	1/6	3/8	2.5	2.5	2.5	6
	2nd	—	—	1/4	3/8	1/2	—	3.75	5.6	7.5
5th . . .	1st	—	—	1/4	1/2	5/8	—	3.75	7.5	9.5
	2nd	—	—	1/4	1/2	3/4	—	3.75	7.5	11.25
6th . . .	1st	—	—	1/3	5/8	3/4	—	5.0	9.5	11.25
Total consumption in kg . . .							12.75	19.0	36.00	57.5

100 kg of the mixture contain: — 30 kg of oats, 30 kg of lupin steeped for 24 hours, 20 kg of soybeans or crushed maize, 10 kg of ground peanut cake, 10 kg of sunflower seed cake.

With the dried beet cossettes are mixed daily 5 to 6 kg of prepared chalk.

The rationing scheme of LEROY & BOISSEAU (see Table X) is intended for early maturing lambs marketed at 4 1/2 months weighing about 40 kg. Average gain = 270 gm per day.

TABLE X. — *Rationing scheme of LEROY & BOISSEAU.*

Period	From birth to 1 month	From 1 to 2 months	From 2 to 3 months	From 3 to 4 months	From 4 to 5 months
Scheme No 1, without beet					
Bran	Ewe's milk A little from the 4th week	Ewe's milk 25 gm	Ewe's milk 85 gm	Ewe's milk 160 gm	— 450 gm
Oats	—	15.9 (meal)	60 gm (meal)	150 gm	350 gm
Hay	—	50 gm	75 gm	250 gm	300 to 500 gm
Linseed and groundnut cake.	—	—	—	—	150 gm
Fodder units	—	0.05	0.14	0.35	0.96
Scheme No 2, with beet					
Bran	Ewe's milk A little from the 4th week	Ewe's milk 25 gm	Ewe's milk 75 gm	Ewe's milk 100 gm	— 150 gm
Oats	—	15 gm (meal)	50 gm (meal)	—	—
Barley	—	—	—	100 gm	200 gm
Maize	—	—	—	—	150 gm
Linseed cake	—	—	—	—	50 gm
Beet	—	a few grammes	250 gm	750 gm	2.5 to 3.5 kg
Hay	—	50 gm	75 gm	150 gm	400 gm (lucerne)
Fodder units	—	0.05	0.15	0.35	0.97

The rations used by FRÖHLICH & LÜTHGE in the experiments mentioned above, were the following :—

a) *Sucking lambs.* — Were fed the rations shown in Table XI.

TABLE XI. — *Rations for sucking lambs.*

Feed	Weeks									
	7th	8th	9th	10th	11th	12th	13th	14th	15th	
Dried beet cossettes	103.0	103.0	123.0	137.0	137.0	171.0	205.0	205.0	240.0	
Oats	68.0	82.0	103.0	137.0	68.0	68.0	68.0	68.0	205.0	
Oilcake mixture	14.0	21.0	21.0	34.0	34.0	68.0	68.0	68.0	103.0	
Bran	21.0	34.0	34.0	34.0	137.0	171.0	205.0	274.0	68.0	
Meadow hay	103.0	103.0	103.0	205.0	205.0	—	—	—	—	
Lucerne hay	151.0	151.0	151.0	205.0	205.0	410.0	410.0	410.0	480.0	
Available protein	32.1	35.2	36.7	54.4	60.4	75.3	86.1	94.1	110.0	
Starch equivalent	182.4	196.1	218.5	305.3	313.0	366.6	377.0	412.0	473.0	

The ewes received per head daily :— dried beet cossettes, 337 gm ; beet tops ensilage, 281 gm ; bran, 180 gm ; oats, 97 gm ; mixed cattle cake, 147 gm ; hay, 705 gm ; straw, 1500 gm. This ration contained 128 gm of available protein and 833 gm of starch equivalent. The average daily gain per lamb was 230.6 gm. The weight at the age of 3 months and 21 days was 28.14 kg.

(b) *Weaned lambs.* — At the beginning of the experiment the lambs were aged 3 months, 4 days; at the termination 5 months, 11 days. Average daily gain, 280 gm. The lambs were divided into several lots. The basic daily ration was from 250-600 gm per head of (a) beet tops, (b) dried beet cossettes, (c) beet tops ensilage (from pits). As concentrates they received daily:— mixed cattle cakes, 250-500-600 gm; oats, 100 gm; lucerne hay, 200-250 gm.

The dried beet tops and cossettes gave similar good results. The daily gain was lower in the lot fed beet top ensilage, and the writers recommend using only first quality ensilage.

A fourth lot was fed a ration containing less protein (114.7 gm instead of 179.7 gm), but the average gain was only 206 gm, against 245 gm in the other lots.

The examples cited will suffice to show the composition of the rations. In conclusion a few notes will be added on the tests of various feeds made in the United States by BROWN and BRANAMANN.

Their rationing experiments were carried out with 7 lots of 15 lambs for the comparison of maize and barley, maize and oats, oats and barley, lucerne hay and maize ensilage + lucerne, ground linseed cake and a ration without protein supplement, oats alone and oats + a protein supplement, and to determine the gain with this supplement.

TABLE XII. — *Rations fed to 7 lots of lambs.*

Lot	Rations
1.	Lucerne hay + crushed maize
2.	" " + " " + ensilage
3.	" " + 7 parts of crushed maize + 1 part of ground linseed cake + ensilage
4.	Similar to lot 3 but with oats instead of maize
5.	" " 4 but with 14 parts of oats
6.	Lucerne hay + barley + ensilage
7.	Similar to lot 6 but with oats instead of barley.

The results of this experiment are given in Table XIII. They show that maize was more fattening than barley and much more than oats. The addition of linseed cake meal did not increase the gain in fattening with maize.

TABLE XIII. — *Results of feeding experiments of BROWN & BRANAMANN.*

Rations to produce 100 kg gain in live weight	Lot 1	Lot 2	Lot 3	Lot 4	Lot 5	Lot 6	Lot 7
Crushed maize kg	303	311	234	—	—	—	—
Linseed cake meal "	—	—	40	45	25	—	—
Lucerne hay "	501	333	365	398	409	429	455
Beet ensilage "	—	269	264	305	314	323	339
Oats "	—	—	—	315	346	—	404
Barley "	—	—	—	—	—	382	—
Average daily gain	170	170	176	160	154	150	141
Cost of the ration, in dollars, for a gain of 45.4 kg	8.31	8.41	8.94	9.92	9.99	10.07	10.86

Publications consulted.

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AGRICULTURAL INDUSTRIES

Development of the Dairy Industry in Lithuania.

The dairy industry or more particularly butter production, plays an important part in the national economy of Lithuania. This industry is comparatively recent, having developed only since the war.

Co-operative dairying has made great progress in consequence of low interest loans granted by the State for the formation of cooperative dairying societies. The development was particularly rapid between 1925 and 1927. The number of co-operative societies was 3 in 1923, 24 in 1924, 97 in 1925, 211 in 1926, 256 in 1927, 260 in 1928, 262 in 1929, and 272 in 1930.

In 1930 the number of private dairies had reached 80, so that the total number of dairies in the country was 352.

The creamery stations, where the milk is skimmed, are also an important part of the dairy industry in Lithuania. The cream is there cooled and delivered to the dairy for pasteurisation.

The number of creamery stations was 53 in 1927, 172 in 1928, 400 in 1929, and 1190 in 1930.

The greater part of the milk is used for butter production in the dairies, though a certain amount goes for the preparation of hard and soft cheeses and curd.

Although Lithuania itself consumes large quantities of butter, since 1924 there has been an increasing export trade, as shown by the following figures :—

Export in 1925	932.3 tons, valued at	7,148,400	liras It.
" " 1926	1746.8	" " "	12,707,900
" " 1927	2051.3	" " "	13,565,300
" " 1928	2642.6	" " "	20,308,000
" " 1929	4083.7	" " "	31,376,100
" " 1930	7356.8	" " "	46,890,100

Since 1927, there has been an impartial State control of butter exports. The Ministry of Agriculture has issued an order to this effect, putting the control into the hands of a special Commission of the Ministry. A special tax is levied from the butter exporting firms to cover the costs of this control. The same order forbids the exportation of butter containing over 16 % of water, preservatives other than common salt, and analine dyes, also of butter insecurely packed.

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Notes.

QUICK-FREEZING CITRUS FRUIT JUICES AND OTHER FRUIT PRODUCTS. — E. M. CHACE and H. D. POORE have published in *Industrial and Engineering Chemistry*, Oct. 1931, a preliminary report dealing with quick-freezing of fruit juices (including orange, grapefruit, lemon, tangelo, apple, pomegranate, and pineapple) in crown-cap bottles, in vacuum-closure glasses and glass jars, and in tin cans. Grapefruit hearts, orange slices, pineapple slices, etc., have been frozen both in glass and in tin. Experiments do not show that replacing the air in the head space above the juices or washing out dissolved air with carbon dioxide has any marked effect on the flavour of the juices. Too much carbon dioxide in the juices gives them an off-flavour.

With frozen fruits, a slight improvement was noted when carbon dioxide was used; this was marked when friction-top cans were used. Vacuum-packed fruits are better than the ordinary pack. Freezing can readily be carried out in crown-capped glass bottles, 4 or 8 ounce, before or after capping, and in 8-ounce glasses or 12-ounce glass jars, with or without vacuum.

Open freezing and freezing in friction-top cans is not recommended unless special precautions are taken for storage out of contact with air.

ETHYLENE TREATMENT OF TOMATOES. — Ethylene and propylene were found to be without effect on the rate of development of red colour on tomatoes unless they were picked at such an immature stage that they would not have developed red colour for some time if left on the vine. Such tomatoes would not be suitable for canning because of low yield and poor quality. (*Industrial and Engineering Chemistry*, Oct. 1931).

ALCOHOLIC FERMENTATION OF A GLUCOSE SOLUTION WITH BREWERS' YEAST IN THE PRESENCE OF RADIO ACTIVITY. — In *L'Industria Chimica*, October 1931, DE FAZI discusses the action of radiant energy on microorganisms and states that for a given wave length there is a maximum activity and rate of reproduction for a given organism. It is shown that radiation has an activating effect on alcoholic fermentation by brewers' yeast with an intensity of 1.5 millicurie in 100 c.c. of 10 % glucose solution with 5 gm of yeast; it reaches a maximum with 2 millicurie and then decreases with 2.75. A de-activating effect began with 3.5 millicurie and increased with 4.5-5.75, then an injurious action on the yeast and therefore on fermentation began with 6.75 millicurie.

PREPARATION OF VINEGAR FROM COFFEE FRUIT PULP. — To secure a rapid and uniform fermentation the coffee fruit pulp must be reduced to a mash. When this mash is pasteurized at 75°C during 45-55 minutes and then inoculated with a culture — e. g., of *Saccharomyces octoporus* — a good fermentation sets in within 24 hours (at 23-25°C) and reaches its climax on the 4th day. After 12 days the fermentation is complete and clarification must follow. Calculated on 100 grams of sugar, an average of 43.5 gm of alcohol is present. The specific gravity of the liquid is about 1.006, and the acetic acid content, 0.25 gm per 100 cc.

When this liquid is acidified in barrels filled with wood chips soaked in previously prepared strong vinegar, the temperature of the acidification room being held at 35°C, the vinegar which results is of a clear Rhine-wine colour, has a smell like pear oil and a taste resembling old whisky. The taste disappears within 3 or 4 weeks of storage and the colour clears up somewhat.

The vinegar has a specific gravity of 1.0154, a total acid content, as acetic acid, of 4.60 %, traces of ethyl alcohol, 3.67 gm of solids and 1.29 gm of ash in 100 cc., 0.97 gm (75.2 %) of this ash being soluble. The vinegar output is on an average about 74 % of the theoretical. (F. W. FREIER, *Industrial and Engineering Chemistry*, Oct., 1931).

NEW METHOD FOR THE NEUTRALISATION OF THE FREE ACID OF OILS AND FATS (French patent No. 665019, Gr. 14, C 14). — MM. JULIAN MARTINEZ ZUMITA and ARMANDO MARTICORENA YRATORZA have developed a method of neutralising free acid (up to 60% and more of oleic acid) by mixing the oil or fat with trieline (C_2HCl_3) or, in certain cases, with tetrachloride of carbon, according to the fat being treated, and then neutralising with alkaline solutions of varying density (4-36° Baumé).

After stirring gently with a circular motion for a few minutes the liquid is neu-

tralised and the soapy residue separates out and rises to the surface. The soap is removed and the liquid washed with a salt solution (10° Baumé), then by distillation a perfectly clear neutral oil is obtained, which can then be decolorized and refined.

NOTE ON THE CHEMICAL COMPOSITION OF SHEA FAT. — Shea fat, or shea butter, is obtained from the seeds of *Bassia Parkii* or *Butyrospermum Parkii*, one of the *Sapotaceae*, a large tree found growing over extensive areas of West Africa and the Sudan. It is usually extracted by crude native methods, such as treating the crushed seeds with boiling water, and comes on the market most commonly as a greyish-coloured soft fat with a granular texture. A rather unpleasant rubber-like odour and taste and a high proportion (4-10 %) of non-saponifiable matter tend to restrict its use as a foodstuff. By suitable refinement it can be rendered more palatable and white. Investigation of the chemical composition of shea fat has been carried out partly under the direction of Prof. I. C. DRUMMOND, partly by S. J. HOPKINS and F. G. YOUNG chemical examination of a sample of crude and a sample of refined shea fat shows that :—

The chief fatty acids are palmitic, stearic, and oleic.

The non-saponifiable matter contains considerable amounts of an unsaturated hydrocarbon $C_{33}H_{56}$, m. p. 64°, apparently identical with illipene isolated by KOBAYASHI from illipé fat. There were also present resins, a substance resembling gutta, and small amounts of phytosterol and higher alcohols (*Chemistry and Industry*, London 1931, Vol. 50, No. 42, pp. 389^t-391^t).

NEW INSULATING MATERIALS OF PLANT ORIGIN — A number of plant products, many of them factory by-products, are being utilised in the manufacture of new thermic insulators. Increasing knowledge of the conductivity coefficients of many plant products is making it possible to select and make use of valuable insulating materials from among the waste products of certain of the staple crops, such as sugar cane, maize, textile and oil-yielding plants, tobacco, etc., which are particularly hardly hit in the present world economic crisis and in need of additional market outlets.

Certain woods (sawdust, shavings, etc.) possess strong insulating powers and can compete in this field even with cork; the following are examples :—

	Coefficient of conductivity (K) transversely to the length of the fibres
<i>Musanga Smithii</i>	0.065
<i>Horminiera Elaphronxylon</i>	0.047
<i>Kingia Australis</i> (sapwood)	0.065

Balsa wood (*Ochroma Lagopus* Sw.) has a conductivity between 0° and 50°C of 0.040. It is much used, specially in America, for making insulating containers for the long distance transport of perishable materials which must be kept at a low temperature by means of solid CO₂, etc. Balsa wood is however very hygroscopic, readily inflammable and liable to rot. But it will not be difficult to treat this and similar products in such a way as to reduce their hygroscopicity and inflammability without affecting their conductivity, and where necessary to modify their pH so as to increase their resistance to rot.

'Dry-Zero', which is obtained from the capsules of the ceiba tree, is made from extremely light, fine tubular fibres. In consequence of its high insulating value as compared with cork it has come into common use for insulating cars, cases, etc., for protecting camps in arctic regions, etc.

In Russia certain by-products of the wool industry have come into use for insulating, such as 'Morosine' (K at 0°C = 0.043; specific weight = 266 K/m³), 'Scheveline' (K at 0°C = 0.037; specific weight = 125 K/m³) and 'Lonisguite', a waste product of sunflower growing (the sheet material with a density of 0.3 has a conductivity of K = 0.054).

Other crop residues, from hemp, castor oil growing, etc., may also in all probability produce products with high insulating properties.

Utilisation of algae as insulating materials. — The commercial product 'Arki'

($K = 0.034$) is formed of a mass of dried seaweed held between sheets of strong parchment paper. Other algae with low conductivity can serve the same purpose and be substituted profitably for 'Arki'. If the 'algina' and 'norgina' were extracted from the algae and combined with certain elements ($Al + Cu \frac{1}{10}$) it would check the deterioration and crumbling of the material and thus render it less inflammable and more elastic.

'Insulite', a felt of spruce fir fibre (K at $0^{\circ}C = 0.034$) and 'Celatex', sugar cane trash autoclaved at $200^{\circ}C$ and compressed into a sheet (K at $0^{\circ}C = 0.0409$) are already well known insulating materials (see this *Bulletin*, 1930, No 12, p. 471). Large 'Celatex' factories have recently been opened in the United States and the material has met with such success that canes with low sugar content have been grown merely for the sake of the fibre.

The cost of these insulating materials is however still high and good and economical insulation can be obtained from other sources, such as alfa, *Imperata cylindrica*, maize stover, etc.

'Solomite' is an economic product with good insulating properties (K at $0^{\circ}C = 0.0675$), light, practically incombustible, and obtained from straw compressed under 7 atmospheres and reinforced with wire. The commonly used straws are wheat and oats but improvements can be introduced by using stover of maize or rice, rushes, alfa, husks of cotton, stems and husks of groundnuts, etc.

The insulating properties of cellular sheet rubber ($K = 0.032$ to 0.043 at $35^{\circ}C$) are well known, as also are other plant and mineral insulators used for various purposes, particularly in cold storage. It will be of more value to the farmer however to have information about the insulating properties of agricultural products. These can be used for glasshouses and frames, as mulches, for orchards, store houses, etc. and in all cases where sudden changes of temperature are to be avoided. Cases covered with insulating material are invaluable for preserving perishable produce, as is shown by the fact that for many products the possible length of storage is a function of the rapidity with which they reached the more suitable conditions of temperature and hygroscopicity. On small and large agricultural and industrial establishments (wine and cheese factories, etc.) the choice and application of suitable and economical insulators is one of the main factors of success. (*Les Isolants modernes*, report by M. F. PORTAL, presented to the 5th National Cold Storage Congress, Paris, June 1931).

F. G. & G. S.

BOOK REVIEWS *

Soils and Fertilisers.

BEAR Firman F., *Soil Management*, Second edition, thoroughly revised and enlarged, second printing corrected, 412 p., 58 fig. New York 1931, John Wiley & Sons, Inc.

[The purpose of this book is primarily to acquaint students of agricultural colleges with the applications of the scientific principles that are of use in planning systems of soil management and in increasing the productive capacities of soils. The general plan and contents of this edition are similar to the first. The 5 parts deal with the following subjects:—

I. *Requirements of crops* (3 chapters). — Factors affecting crop growth; nitrogen, mineral and water requirements of crops.

II. *Characteristics of soils* (7 chapters). — Origin and classification of soils; chemistry, biology and physics of soils; water and air in soils; the soil solution.

III. *Utilizing soil resources* (4 chapters). — Control of soil water; mechanical improvement of soils; supplying organic matter; rotating crops.

IV. *Conserving soil resources* (5 chapters). — Nitrogen, mineral and limestone economy in soils; the livestock system of farming; soil sanitation.

V. *Supplementing soil resources* (7 chapters) — Controlling soil reaction (liming); nitrogen, phosphoric acid, potash and mixed fertilizers; selection and application of fertilisers.

(*) Under this heading are included short synopses of books received for review.

The book has been brought up to date by a considerable number of changes and supplementary information].

Crops of Temperate Regions.

COX Joseph F., *Crop Production and Management*, second edition, revised 469 p., 188 fig. New York 1930, John Wiley & Sons, Inc.

[A revised edition of this valuable manual has been published in the Wiley Farm Series. The volume contains up-to-date practical information about the growing of maize, wheat, oats, barley, rice, buckwheat, flax, sorghum, clover, lucerne, soybean, hay, potatoes, sugar beet, etc.

Practices developed by the more successful farmers or contributed by scientific investigations which are effective in reducing cost of production, improving the market quality of crop products and placing the upkeep of soil fertility on a more permanent basis receive special emphasis.

Though intended primarily for students in the United States this book will be of value to students and teachers of agriculture wherever similar crops are grown].

A. M. F.

Lavori del R. Istituto Botanico di Palermo, Vol. I, 188 + (56) p. con 8 tavole e 39 figure nel testo, Palermo 1930, Tipografia Nazionale.

[The Royal Botanical Institute of Palermo (Director, Prof. Luigi MONTEMARTINI), is in future to publish its activities in this form. This first volume which contains its report for the years 1929 and 1930 must be regarded as a continuation of the *Contribuzioni alla Biologia vegetale* (1894-1909) and of the *Bollettino del R. Orto Botanico di Palermo* (1897-1921).

Part I contains a report of the work of the Institute itself. Among the most interesting contributions are:— Causes of sterility in the genera *Agave* and *Fourcroya*, by G. CATALANO — Anatomical and physiological study of the red and green leaves of certain aloes, by F. BRUNO — Preliminary study of the acids of the sap of *Agave*, by G. CATALANO — Research on the influence of extracts of internal secretory glands on plant growth, by G. DELLEPIANE and F. GIOELLI — Observations on the behaviour of leaves in the Mediterranean climate, by L. MONTEMARTINI.

Part II is the *Bollettino del Giardino Coloniale*; the contents include:— Experiments on certain drought-resistant fodder plants, by F. BRUNO — Utilisation of extracted leaves of *Andropogon citratus* D. C. as fodder, by F. SORGÈS — *Chamaerops humilis* as a source of paper pulp, by F. SORGÈS — Species of *Agave* which have flowered in the Royal Botanic Gardens at Palermo].

Tropical Agriculture.

PELETOT P. A. et MAGALON M., *Éléments de botanique Indochinoise*, 1 vol., 205 p., 41 planches. Imprimerie d'Extrême-Orient, Hanoï, 1929.

[This work is based on a course of lectures delivered for some years by the writers. It is intended as a manual of botany for use solely in Indochina and the examples are chosen from among the common plants of the country. It deals with the plant cell, plant tissues, the root, stem, leaf and flower, development of the ovule and ovary germination, principles of plant classification, classification of the Thallophytes, Bryophytes, Vascular Cryptogams and Phanerogams.

The work is well illustrated].

LAN J. (Ingénieur agricole, Directeur de l'Ecole Supérieure d'Agriculture et de Sylviculture d'Indochine), *Les plantes indochinoises de grande culture*, 2^{ème} partie: *Plantes industrielles et quelquefois alimentaires*, 1 vol., 410 p., 48 planches. Imprimerie d'Extrême-Orient, Hanoï, 1930.

[This volume is a continuation of the previous work on Food Crops of Indochina and will be followed by a third on Industrial Plants.

The following plants growing in Indochina are studied : — oil-yielding plants — coconut, groundnuts, sesame, castor oil ; sugar plants — sugar cane and the sugar palms *Borassus flabelliformis* and *Nipa fruticans* ; fodder plants — Guinea grass, Para grass, teosinte, mulberry ; textile plants — cotton, jute, kapok, ramie, abaca, agave.

The volume is magnificently illustrated].

J. L.

Agricultural Engineering.

ETCHEVERRY B. A. *Land Drainage and Flood Protection*. — McGraw-Hill Book Company, New York 1931, 327 pp., 141 figs.

[The work deals with the surface drainage and underdrainage of agricultural lands, affected by excessive water due to precipitation or irrigation ; the protection of lands against flood and tide waters ; and the methods of spreading assessments for the apportionment of the cost of several classes of improvements to the areas benefited. It emphasizes fundamental theories and principles of design and will be useful to engineers interested in land drainage and the protection of overflow lands.

The first eight chapters deal mainly with the surface and underdrainage of lands in which the need for drainage results from excessive precipitation or lack of natural drainage. Chapter IX on the drainage of water-logged irrigated lands indicates that the methods of control of soil moisture for lands which are water-logged by irrigation are not very different from those for land which need drainage because of excessive precipitation, so that special methods of drainage of water-logged irrigated land may in some cases be used to advantage for wet lands in humid regions. Chapter X deals with the protection of lands from flood waters, chapter XI with some special problems in the computation of flow in river channels, chapter XII with the organisation procedure, powers, and operation of drainage and reclamation districts. The value of the book is enhanced by the use and presentation of well selected information, data and opinions from different authorities].

DAVIDSON J. Brownlee, *Agricultural Machinery*, John Wiley & Sons, Inc., New York 1931, 396 p., 600 fig.

[This new work by the Professor of Agricultural Engineering at Iowa State College represents an effort to organise and present in readable form the most useful information on agricultural machinery available at the present time. The rapid development of machinery and the numerous kinds and types of farm machines increase the difficulty of selecting the more important machines ; even during the preparation of the manuscript several new machines were put on the market. The writer has however successfully achieved the difficult task. The work is divided into the following chapters. — (1) The relation of agricultural machinery to agricultural progress — (2) The function of machines and some mechanical principles — (3) The elements of machines — (4) Materials used in the construction of agricultural machines — (5) The design of agricultural machines — (6) Transmission of power — (7) Measurement of power — (8) Friction and lubrication — (9) Tillage — (10) Ploughs — (11) Plough operation and adjustment — (12) Harrows, rollers and pulverisers — (13) Cultivators — (14) Seeding machines — (15) Corn (maize) and cotton planters — (16) Grain harvesting machines — (17) Thrashing machines — (18) Combined harvesting and thrashing machines — (19) Corn (maize) harvesting machines — (20) Mowers — (21) Machines for making and handling hay — (22) Machines for growing and processing cotton — (23) Machines for growing potatoes — (24) Machines for growing garden and truck crops — (25) Special machines for corn (maize) — (26) Feed preparing machines — (27) Grain cleaning, grading and separating machines — (28) Grain conveying and elevating machines — (29) Machines for distributing fertilizer — (30) Pumps — (31) Spraying and dusting machines — (32) Machines for the dairy — (33) Vehicles — (34) Life, use and cost of agricultural machines — (35) Selection and management of machines — (36) Care and repair of agricultural machines — (37) The manufacture of agricultural machinery in the United States].

H. J. H.

FORESTRY

Miscellanea.

FORESTRY IN THE PHILIPPINE ISLANDS. — About 64 %, of the total area of the Philippine Islands, viz., 19,090,149 hectares is under forest and the Bureau of Forestry estimates the volume of accessible growing stock at 1,148,217 cubic metres. The amount of timber per hectare reaches 300 m³ and many of the species produce extremely valuable material for the cabinet making industry. The Philippines possess 115 working saw mills and in 1929 the total timber production amounted to 1,658,568 m³ and 245,993 m³ were exported. Writing in the *Tribune* (Manilla, 1 April 1931) Placido DACANAY states that afforestation work is making good progress in the Philippines and it is estimated that about 2 million hectares of the so-called "Cogon land" (grassy steppes mainly covered with *Imperata exaltata* and *Saccharum spontaneum*) ought to be planted. After trials made with over 600 species in order to determine those best adapted for the purpose, a certain number have been finally selected of which the following are the most important: *Leucaena glauca*, *Aleurites moluccana*, *Vitex parviflora*, *Bombycidendron vidalianum*, *Pterocarpus* sp., *Tectona grandis*, *Swietenia Mahagoni*, *Pterocymbium tinctorum*, *Cedrela odorata*, *Pinus insularis*.

A great deal of instructional and propaganda work in forestry has been carried out. Lectures on forests conservation, on flooding and on erosion have been delivered especially in disforested areas, demonstration plots illustrating afforestation methods have been established, every encouragement given to farmers to induce them to plant forest trees and a suitable school propaganda is in vogue.

Laws on reafforestation were published in 1916 and in 1926, which include provisions for granting subventions, the sum allowed under the first law being 10,000 and under the second 50,000 pesos.

The Bureau of Forestry has classified the areas for afforestation, under four categories: (1) areas which are of special importance from the point of view of water supply, to prevent erosion, for shifting sand, etc.; (2) areas specially intended for producing timber; (3) areas to supply cover for game; (4) areas to be afforested for the amelioration of climatic conditions or the provision of amenities.

Between 1927 and 1930 nearly one and a half million hectares were surveyed from the standpoint of their importance in connection with water supply, and afforestation has been recommended for upwards of one half of this area. The writer reports in detail on the four schemes of afforestation which are now being carried out, the work already performed, the results obtained with particular varieties and the methods followed.

The Bureau of Forestry assists individuals and institutions which propose to carry out afforestation schemes, paying the salaries of specialist forest officers for general direction and supplying without charge the young plants available in the Government nurseries.

As regards the export trade it is noted that the foreign demand for timber from the Philippines is on the increase and special efforts are being made to develop the trade in resin, which is obtained from the bark of the "Almaciga" (*Agathis alba*). It is also believed that the "Benguet Pine" (*Pinus insularis*) which is very abundant in the Philippines is excellently adapted for giving a good supply of turpentine and attempts are also being made to extend the trade in this product.

R. W.

FORESTRY IN POLAND. — Poland with a forest area of approximately nine million hectares stands sixth on the list of the great timber-producing countries of Europe (the first being Russia followed by Finland, Sweden, Germany and France in the order given) according to BADOUX writing in the *Journal Forestier, Suisse* (Berne 1931, No. 4, p. 73; No. 5, p. 102). The members of the Polish Forestry Service are exceptionally enthusiastic workers and Poland generally stands in the forefront of the movement for the protection of natural wealth and amenities and in this connection gives a fine example to other European Countries.

The area of the State forests is 2,835,000 hectares and the remaining forest lands cover 6,108,000 hectares, the proportions of the total being approximately one-third and two-thirds respectively. Communal forests represent only 4 % and forests in private ownership as much as 62 % of the total forest area. Regarding private ownership,

it may be noted that 3,656,000 hectares of forest are in the hands of 3,976 persons, giving an average of 920 hectares each, while 13,230 persons own over 50 hectares each of forest, with an average of 306 hectares.

As regards the species found in the forests of Poland, the most important is the Scots pine, grown on 60 % of the area, while spruce, oak and fir account for 12 %, 5 % and 3 % respectively and various other species for the remaining 20 %.

A number of the non-State forests are bound by law to be exploited under management schemes. In 1923, no less than 75 % of the total area of such forests were under the supervision of the offices responsible for forest protection and of these 47 % were worked under regular schemes. In 1921 management schemes were adopted for 113,000 hectares, in 1923 for 690,000 hectares while by the end of 1924 all the State forests were properly organised.

In 1926 the yield from the State forests was estimated at 8,066,000 cubic metres (2.85 cubic metres per ha) ; that of privately owned forests above 50 ha. in extent, at 10,237,000 cubic metres (2.42 cubic metres per ha). and that of the private forests below 50 ha. at 3,110,000 cubic metres (1.62 cubic metres per ha.) while the total production amounted to 21,413,000 cubic metres with a general average of 2.39 cubic metres per hectare.

For the transport of timber Poland possesses natural water-ways 6,685 km. in length with in addition, 264 km. of navigable canals. The narrow gauge railways are utilised for land timber transport and in 1924 the length of these railways was 1,414 km.

The low rate of home timber consumption in Poland greatly facilitates its export trade. Only 30,000 tons of cellulose are manufactured annually ; on the other hand the wood distillation industry is highly important and the factory at Bielowieza is the largest in all Europe. Both as regards quantity and value sawn timber represents the most important element in the Polish timber trade.

Instruction in forestry is provided by three Higher Schools and a *Commission for technical forestry research* has been established at the Ministry of Agriculture at Warsaw.

The *National Council for the Protection of Natural Features* dates from 1925. This body carries on a very active propaganda and has its own journal ; in addition it has drawn up a list of the most important " natural monuments " and established a number of national parks. According to the particulars provided by M. W. SZAFFER, President of the Council, the results of its work may be thus summarized. establishment of 6 National Parks for a total area of 25,196 hectares or 48 forest reserves with an area of 5,469 hectares and of 35 reserves in the Steppe districts with an area of 330 hectares.

FORESTS AND FORESTRY IN RUMANIA. — The total area of Rumania at the present time is 294,892 square kilometres of which 6 500,000 are under forest while open glades and clearings account for a further 725,000 hectares so that no less than 24.5 % of the area of the country may be considered as forest land.

In 1930 the forests of Rumania were thus classified : State forests, 1,853,800 ha. ; Private forests, State controlled, 774,700 ha. ; Communal forests, 1,226,200 ha. ; Private forests, 2,670,000 ha.

The greater part of these extensive forest tracts are to be found in the region of the Carpathians and in the provinces of Transylvania, Bukovina and Moldavia, more than half of the total forest area being situated in Transylvania which, prior to the war, belonged to Hungary. Of the million acres of primeval forest still surviving in South East Europe, approximately one half is in Rumania.

During and immediately after the war, there was a reckless destruction of forest resources and, since 1918, upwards of 800,000 hectares of forest land have been expropriated and passed into the hands of peasant occupiers. The loss has however been to a great extent compensated by Government intervention and the enactment of legal measures to secure the replanting of cleared forest and to safeguard the maintenance of the existing afforested area.

Production is devoted in the first place to the demands of the home market for manufactured timber and firewood. Exports amount to 19 million tons per annum, but the timber industry in Rumania is seriously handicapped by shortage of capital, a tax on exports and the competition of the Scandinavian countries and of Russia. There are nearly 500 sawmills but a large number have recently been closed owing to the general trade depression.

The chief export markets for Rumanian timber are in Greece, Turkey, Asia Minor, Egypt and Northern Africa and there are excellent transport facilities by rail and river to the Danube and thence to Galatz and the Black Sea.

There are two Forest Authorities in Rumania which work in close cooperation. The Statute of April 25, 1930 placed the State Forests under the State Autonomous Forest Board, which is administered by a Director-General with an Assistant-Director and an administrative Council. The remaining forests are subject to the "Forest Régime" under the Ministry of Agriculture and Domains. The working and management of private forests is carried out in accordance with the terms of a code of Regulations, forming part of the Forestry Laws of 1910. These Regulations were drafted with the object of securing the systematic exploitation of the privately owned forests and the application of proper methods of management, including regulated fellings and re-afforestation followed by systematic exploitation according to working plans. The Forest Board has the assistance of a Technical Council, responsible for seeing that the forestry laws are given proper effect. Replanting within five years is now compulsory and exploiting firms are required to deposit a certain sum for each hectare of forest land which they desire to cut over, as a pledge that they will carry out a satisfactory scheme of afforestation on the area.

The above notes are based on an interesting descriptive article on Forestry and allied questions in Rumania by W. L. TAYLOR in the October issue of the *Quarterly Journal of Forestry* (London).
R. W.

AFFORESTATION IN SOUTH AFRICA. — According to H. M. STEVEN (*Forestry*, Oxford University Press, London 1929, No. 2) the total area of high forest in the Union of South Africa is about 1,042 out of a total land area of 471,917 square miles. The present programme of Government afforestation is for approximately 15,000 acres annually and the total area afforested under the scheme was 184,448 acres up to 31 March 1929. The principal limiting factor in high forest development in South Africa is low rainfall.

At present *Eucalyptus* spp. are used on a relatively small scale for afforestation purposes only, *E. paniculata* being preferred for the poorer soils and *E. microcorys* and *E. saligna* for the better sites where conditions are subtropical. The last named species is capable of yielding 50 tons of pit props per acre with a 5 years rotation.

Afforestation is mainly carried out by means of conifers, those in commonest use being *Pinus Pinaster*, for the poor and acid soils of the warm temperate regions of the South, and *P. insignis*, for the more suitable sites. Seeds are carefully selected and whenever possible before sowing, the land is ploughed and harrowed and then left fallow for twelve months when ploughing and harrowing are repeated, generally crosswise. When the ground is too steep and rock, for ploughing the ground is broken up before starting on afforestation work. *Pinus Pinaster* is almost always established by direct sowing as also not infrequently *Pinus canariensis*, now used on a considerable scale for the better soils, whereas all the other species, including *P. patula*, *P. longifolia*, *P. caribaea*, *P. Taeda*, etc., are practically invariably planted.

Growth is phenomenally rapid. *P. Pinaster*, the slowest growing, is usually 15 feet high at 10 and 40 feet at 20 years and *P. insignis* reached a height of 90-100 feet in a stand at Tokai at 20 years. *P. canariensis* is intermediate between these two as regards height and growth. *E. saligna*, the fastest growing eucalypt, usually grows 50-70 feet in 5 and 80-100 feet in 10 years. An ample rotation for the production of saw timber appears to be between 40 and 60 years for pines and thus yields of 200-250 cubic feet per annum and per acre may be expected for *P. Pinaster* and 300-400 cubic feet per annum for the faster growing species, thinning yields being included in both cases. The yield for eucalyptus up to 20 years has been from 150 to 400 cubic feet per acre. *P. pinaster* is usually thinned from the fifth to the seventh year when the height is only 6-9 feet and thereafter every three to five years. *P. insignis* and *P. patula* require heavy low thinning at 7-10 years.

The object of growing eucalypts, which require copious soil moisture, is to produce large size timber for sleepers. In order to secure satisfactory growth conditions, mixture with other species is being tried, *Syncarpia laurifolia* being now in favour.

Forestry research up to the present has been mainly concerned with the selection of exotic trees specially adapted to the different conditions and economic requirements of the Union. Thinning trial plots have also been established in plantations of various species. Naturally the quality of the timber which will be produced by the different species now being introduced remains an uncertain factor but the small quantities already available have been marketed at relatively remunerative prices. Research work connected with the important problem of the regeneration and improvement of the indigenous forests is also being carried out by the Department and has been centralised at Deepwells, Knysna.
R. W.

EXOTIC SPECIES INTRODUCED INTO EUROPE. — (1) *The cultivation of hickory in Europe.* — Among the hickories (*Carya*, a tree allied to walnut originating in North America and partly also in China) are to be found (according to an article by H. SCHWARZ (Vienna) entitled "Die für den Anbau in Mitteleuropa bedeutungsvolleren Hickoryarten", *Forstwissenschaftliches Centralblatt*, Berlin 1931) certain varieties, which are well worth growing also in Europe alike from the timber and from the alimentation standpoint. *Carya alba* (white walnut), *C. glabra*, *C. laciniosa*, *C. ovata*, and *C. cordiformis* are mentioned as being the most resistant to cold and the most suitable for acclimatisation in Central Europe. It is merely necessary to pay careful attention to the special conditions in which this species can be grown successfully, which the writer describes as under.

Hickories do not, even in their native habitat, grow as large stands but rather in clumps or as isolated elements in stands; even so they represent 4 % of all the broad-leaved forest of the United States of America. All varieties require a well aerated rich sandy-clay soil, and particularly in their early years are much affected by cold. At the same time *Carya alba* and *C. ovata* which are the most resistant to cold, when planted in the neighbourhood of Vienna, were found to have been little affected by the extremely cold 1928-29 winter. Hickory may be considered to be a shade or half shade tree and *Carya glabra*, *C. ovata*, *C. laciniosa* and *C. alba* do well in well shaded places.

The timber yield of hickory as compared with that of other broad-leaved varieties is not very considerable and it is rather the characteristics of the timber, e. g., its hardness, weight, resistance to pressure and elasticity, that make it so desirable an element in afforestation. A further recommendation is its relative freedom from pests while the abundance of the dead leaves produced annually as soil covering gives it a high value for soil improvement.

Hickory should be sown direct in the place where it is to be grown since on account of its strong taprooting it does not lend itself to transplantation. The best species for mixing with *Carya* are oak, ash, walnut and tulip-tree.

(2) *The introduction of American trees into Europe.* The number of species of trees native to the United States which are capable of being acclimatised in Europe with advantage is constantly rising. DUPLAQUET (France), reporting on his recent visit to the States in connection with a French Forestry mission (*Revue des Eaux et Forêts*, Paris, 1931, Nos. 9 and 10) considers that, as regards the conifers which came under his observation in America, the varieties described below appear well suited for introduction into the South of France and North Africa, where they should be very useful in reafforestation schemes, particularly in areas and in climatic conditions where the varieties already tried have not given the desired results. (1) *Cupressus arizonica*: this species is highly resistant to frost and indicated for dry, low lying regions; (2) *Pinus ponderosa* and *P. arizonica*, which have a strong capacity for regeneration; (3) *Pinus contorta* a species which is suitable for relatively higher altitudes and latitudes by reason of the high quality of its timber yield and its partiality for lands that have been burnt over; (4) *Abies arizonica*, a species well adapted for the higher lands of the drier areas.

(3) *Spontaneous growth of Celtis australis* (nettle tree) in the forest lands of the Great Plain of Hungary. It would appear that *Celtis australis* has established itself naturally on the poor, sandy soils of the Great Plain of Hungary where it had never been previously grown. This fact is considered by J. ÁITAY to be of great practical importance and he has written an article on the subject under the title of "A *Celtis Australis* természetes települése az alföldi erdőkben" (*Erdészeti Lapok*, Budapest 1931, Nos. VII-VIII). He is of opinion that, in the absence of any more valuable kinds of trees, *Celtis australis*, which produces a hard timber of considerable utility, can be used to advantage by foresters, who are engaged in establishing mixed forests on the poor sandy soils of the dunes and plains where the number of species that can be grown advantageously is relatively very small.

G. L.

THE MONTEREY PINE IN SOUTH-WEST ENGLAND. — The Monterey Pine (*Pinus radiata* Don = *P. insignis* Douglas), which has its origin in California, grows with particular luxuriance in South Devon where its rate of growth, both in height and girth, is three or four times more rapid than that of the larch, spruce or silver fir. According to R. J. WYLAM writing in the October number of the *Quarterly Journal of Forestry* (London), one specimen, aged 80 years, was 80 ft. long, had a diameter of 6 in. at top, a quarter girth of 26 in. and gave a yield of over 360 cub. ft. A second tree, aged 46 years was 40 ft. long, 6 in. in diameter, 15 in. quarter girth and gave a yield of 62 cub. ft.

The Monterey Pines in this district were all pot grown and very carefully planted.

As is well known, owing to its meagre fibrous roots, this pine is very difficult to transplant. The timber, when sawn, is light, tough and resinous and, after proper seasoning, it serves well for outside or rough carpentry work. It thrives well near the sea coast showing good resistance to south-westerly gales and provides excellent shelter particularly when grown on exposed sites though naturally the best results are found in sheltered situations.

G. I.

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[The subtitle of this work, which has been presented to the Library of the Institute, indicates that it is intended to serve as a manual for forestry students, foresters, nursery men, forest owners and farmers.

The first edition was published in 1916 by Dr TOUMÉY, Professor of Silviculture at Yale University, in view of the need of a handbook on seeding and planting in forestry practice applicable to the conditions prevailing in the United States and very largely fulfilled its purpose. Since its first publication however fifteen years ago much new information has been obtained through research and practice and a second revised and enlarged edition has now been prepared by Dr. Clarence F. KORSTIAN, Professor of Silviculture at Duke University, embodying the most recent results achieved in nursery and afforestation work.

This work, which has thus been brought quite up to date, is in two parts, following an introduction chapter, which discusses the present state of forests in the United States and the need for reafforestation and provides the economic basis for the seeding and planting work required. Part I consists of five chapters and deals with the silvical and silvicultural basis for seeding and planting, with particular reference to the principles underlying the choice of species, spacing and stand composition. The thirteen chapters in Part II are devoted to questions relating to the formation of forests by seeding and planting and describes the various operations in artificial regeneration and the results that may be looked for from the application of the best practical methods.

The book has been excellently produced and is very fully illustrated. It is supplemented by three alphabetically arranged indexes, giving (1) the common and scientific names of trees mentioned in the book; (2) the names of the writers quoted; (3) the various subjects discussed.

R. W.

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PLANT PROTECTION

INTERNATIONAL BULLETIN OF PLANT PROTECTION

DISCOVERIES AND CURRENT EVENTS *

Algeria : *Rhizoctonia Medicaginis* (1).

Rhizoctonia Medicaginis DC. has made its appearance in lucerne crops in two places in Algeria where at present it remains localised.

It is a new disease for North Africa.

Canada : Plant Diseases in 1930 (2).

The following account prepared by Mr. I. L. Connors, a member of the staff of the Dominion Botanist, is a brief resumé of the observations made on the more important plant diseases in the Dominion of Canada in 1930.

Stem rust (*Puccinia graminis* Pers.) was destructive in Manitoba and eastern Saskatchewan. It was estimated that the losses in Manitoba were : common wheat, 5 to 10 per cent of the crop ; oats, 5 per cent ; barley, under 5 per cent ; durum wheat and rye, no loss.

Stripe rust (*Puccinia glumarum* (Schm.) Erikss. & Henn.) was found on wheat in southern Alberta, but it caused no damage. This rust has also been collected on wheat in British Columbia and along the western boundary of Saskatchewan. Climatic conditions apparently prevent its spread beyond this area. It frequently attacks *Hordeum jubatum* L. but it is very rarely collected on barley.

Limited observations demonstrated the importance of the common buckthorn (*Rhamnus cathartica* L.) in initiating epidemics of leaf rust of oats (*Puccinia coronata* Cda.) in eastern Ontario. Oats growing adjacent to cultivated or escaped bushes were heavily rusted, while at a distance only traces of rust were present.

Wheat bunt has been increasing in destructiveness within recent years in the Prairie Provinces. Of the cars of wheat inspected in the three months ending Oct. 31, 1930, 1.7 per cent of the common spring and 16.6 per cent of the durum respectively were graded smutty. The durum wheat is infected almost exclusively with *Tilletia Caries* (DC.) Tul., while both species are present in common wheat, *Tilletia*

* In this, as in the next chapter, the countries are arranged in French alphabetical order.

(1) Communication from the official correspondent of the Institute, Dr. R. MAIRIS, Professor of Botany in the University and Director of the Botanical Service of the General Government of Algeria, Algiers.

(2) Communication from the official correspondent of the Institute, Mr. H. T. GIBSON, Dominion Botanist, Dominion Department of Agriculture, Ottawa, Canada.

foetens (Berk.) Trel. predominating to some extent in the southern part of each province.

Loose smut of wheat (*Ustilago Tritici*) (Pers.) Jens.) was comparatively rare in British Columbia and Alberta, but it was fairly prevalent in Manitoba and Ontario. In Manitoba the average loss was estimated to be six-tenths of one per cent. Loose smut of barley (*Ustilago nuda* (Jens.) Rostr.) showed a similar distribution.

Covered smut of barley (*Ustilago Hordei* (Pers.) Kellerm.) was extremely common and caused some damage in the Prairie Provinces.

Although both smuts on oats occur throughout Canada, covered smut (*Ustilago levis* (Kellerm. & Swingle) Magn.) is a common and destructive disease from Alberta to Ontario, while loose smut (*Ustilago Avenae* (Pers.) Jens.) is more prevalent in the other provinces of Canada.

An outbreak of stem smut of rye (*Urocystis occulta* (Wallr.) Rabh.) occurred in Saskatchewan. As high as 11 per cent of the plants were infected in some fields. This smut, however, is rare in Canada.

Take-all (*Ophiobolus graminis* Sacc.) was more abundant and more widely distributed on wheat in Alberta this year than in 1929. It was particularly prevalent on the black soils in central Alberta and to less extent on similar soils in the south. Take-all was also reported from British Columbia, Saskatchewan and Manitoba.

Browning root rot, caused by *Pythium* spp., was destructive to wheat in Saskatchewan, on land summer-fallowed the previous year. It was not as severe, however, this year as in the wetter season of 1928.

Foot and root rot caused by *Helminthosporium sativum* P. K. & B. and *Fusarium* spp. is very prevalent and caused some damage in the Prairie Provinces.

Wilt, caused by *Sclerotinia sclerotiorum* (Lib.) de Bary, was locally destructive throughout Canada. In a test of 450 pure lines of sunflower to wilt at Kentville, N. S., infection varied from nothing to 70 per cent.

The growing of potatoes for seed is an important industry in Canada especially in the Maritime Provinces. To be sold as seed the potatoes must pass a rigid inspection in the field and in the bin before they may be certified. Of the fields, which were planted with certified seed and inspected, 24.8 per cent were rejected on account of disease or other causes. Of the fields rejected 53 per cent contained more mosaic than the standards permit. Similarly, 9.4 per cent were rejected on account of black leg, 5.6 per cent on account of leaf roll and 11.6 per cent on account of being adjacent to diseased fields. While the number of fields rejected on account of mosaic closely parallels the number of fields inspected each year the number rejected for other causes has gradually decreased since seed certification became firmly established. In consequence mosaic is assuming more and more importance in the production of certified seed potatoes.

Apple scab (*Venturia inaequalis* (Cke.) Wint.) caused some loss in almost all the important apple growing districts of Canada, but the damage was less than in 1929 on account of the hot, dry weather. The disease is particularly destructive on some of the important varieties such as McIntosh and Fameuse.

Although fire-blight (*Bacillus amylovorus* (Burr.) De Toni) was present in many of the apple growing districts, it was only severe in Quebec in 1930. It was particularly prevalent in four out of the eight apple districts of western Quebec. The disease was especially destructive in the Abbotsford district, where it appeared in the form of blossom blight. In the other districts the disease was less and twig blight was more common.

A tree-to-tree survey of the Okanagan valley was completed last year for perennial canker of apple (*Gloeosporium perennans* Zeller & Childs). It was found that

the disease was in general, more severe on varieties prone to winter injury, which are already no longer recommended for planting for this reason. Naturally the disease is more severe on the older planted varieties and with the control of woolly aphid it is believed that the disease will be fully held in check in the Okanagan valley. It may be pointed out that perennial canker is unknown in the lower Fraser valley, where the climate is typically coastal.

Bacterial fruit blight, a new and destructive disease of loganberry, was discovered on Vancouver Island and in the lower Fraser Valley, B. C. Foster (Sci. Agr. 11:529-534, 1931) has named the causal organism *Bacillus desiccans* n. sp. Besides loganberry (*Rubus loganobaccus* Bailey) he found the wild blackberry (*R. macrophetalus* Dougl.) and the thimbleberry (*R. parviflorus* Nutt.) infected. He also successfully inoculated the immature fruits of the raspberry (*R. idaeus* L.).

Egypt: Occurrence and Movements of Locusts (*Schistocerca gregaria*) (1).

On March 17th 1931, locusts appeared at Halfa coming from the S. E. They did not penetrate into Egypt and soon returned to the South.

Two days later a swarm was reported from Keresko and Singari in the far South proceeding Northwards. On the 20th it flew Eastwards and disappeared in the desert.

Most probably both originated from Halaib where, according to the Sudan reports, the Desert locust was breeding during the preceding month.

Camel patrols scouted the desert East of Assuan Province.

On the 11th a specimen of dragon flies was received from the Frontier's Inspector at Hurgada on the Red Sea Coast. They came in a swarm from the South assisted by a strong South wind.

On the 22nd some dragon flies appeared at Abbasieh (Caire Governorate); they were mistaken for locusts.

On April 15th Transjordan reported the arrival of two swarms of mature locusts believed to have come from the South. They laid no eggs. Fresh arrivals appeared on the 16th and 21st, some in Palestine.

Their appearance in Sinai was expected and this actually happened on the 21st when a swarm of yellow coloured invaders (500 metres long and 50 metres wide) was seen flying near Bir el Maloh going S. W.

Next day a smaller swarm crossed Akaba Gulf to the West while two others were reported from Ras el Nagb and Wadi el Gubi both going Westwards. The swarms of Wadi el Gubi contained few red locusts. On the 24th locusts occupying an area of 100 x 20 metres were discovered at Wadi el Khamila. On the 27th and 28th locusts reached the South Western part of the Peninsula.

Up to the end of April no locusts reached the Nile Valley.

Sinai Governorate, the Frontier Posts in the Eastern Desert and the Provinces were all informed of the situation and warned of an expected invasion.

A locust officer proceeded to El Arish where he demonstrated to the F. D. A. soldiers on the proper use of flame guns, made a tour which covered the greater part of the Peninsula and helped in combatting some mature locusts found at Wadi el Khamila.

Patrols were arranged by Sinai Governorate to scout different regions.

(1) Communication from the Chief Plant Pathologist, Plant Protection Section, Ministry of Agriculture, Cairo, Egypt, to the International Institute of Agriculture.

Four car patrols from the Ministry of Agriculture with flame guns and kerosine were stationed at four posts on the Canal and Suez Gulf to be on the look out and destroy any locusts that might appear.

About 1000 flame guns, remaining from last year's campaign and 500 tons of poisoned bran bait were kept in the Plant Protection stores ready for despatch.

Eritrea: Locusts (*Schistocerca gregaria*) (1).

On March 6, 1921 dense swarms of locusts yellow in colour, after having passed over the zones of Sabarguma, Gudum, Malachia and Dembib, flew in the direction of Ailet to deposit eggs in that territory.

Numbers of other locusts alighted on the 9th near Dubellò in the island of Dalach Chebira; on the 10th they resumed their flight towards the Arabian coast.

On the 12th a few locusts coming from the south deposited eggs near Naro in the valley of Almeda.

On the 14th, 15th and 16th egg deposits were reported in the zones of Damas, Mai Atal, Sabarguma, Ailet, Agambussa, Adì Acebze and Zula.

Between the 15th and the 18th several swarms coming from Dancalia in Abyssinia were reported in Eritrea between Uaddi and Mabra.

On the 23rd numerous hoppers ('cucubtà') made their appearance in the territory of Ailet and towards the end of the month other breeding centres were reported in Asus and Gumot, in the Agambussa and near Zula, along the Red Sea coast.

The extensive regions of the eastern plain infested with 'cucubtà' were crossed and searched by a number of special gangs under white direction who destroyed with poisoned bait the numerous breeding centres reported in the various regions.

In consequence of information supplied by fishermen and island and coast dwellers and also by the Vice Resident of Northern Dancalia (Mersa Fatma) it may be definitely stated that the swarms reported on 19 and 20 January in Dancalia and between 10 and 24 February in the eastern plain (cf. this *Bulletin*, 1931, No. 4, p. 53 and No. 5, p. 74) all came from the coast of Arabia.

United States of America: Outstanding Entomological Features (2).

The present notes refer to April, 1931.

The usual reports of more or less serious cutworm (Noctuidae) damage was received from practically all parts of the United States. Unusual damage by these insects was reported from North Carolina, North Dakota, Nebraska, Montana, and parts of Idaho.

Serious Hessian fly (*Phytophaga destructor* Say) infestations are reported from western Illinois, part of the Platte Valley in Nebraska, and limited areas in Iowa. In Henderson County, Illinois, considerable wheat is being plowed out on account of infestation.

During the middle of April the chinch bug (*Blissus leucopterus* Say) started mi-

(1) Communication from the official correspondent of the Institute, Dr. A. DE SERRAVALLE, Capo dell'Ufficio Agrario della Colonia Eritrea, Asmara.

(2) Communication from the official correspondent of the Institute, Mr. J. A. HYSLOP, Senior Entomologist in Charge, Insect Pest Survey and Public Relations, Bureau of Entomology, United States Department of Agriculture, Washington, D. C.

grating into the fields in Illinois. By the middle of the month migration was observed in Missouri and Kansas. There is a decided indication of serious chinch bug trouble in southeastern Kansas.

The clover leaf weevil (*Hypera punctata* Fab.) is reported as very abundant in central Illinois and parts of Iowa, Missouri, Kentucky, and Kansas.

The pea aphid (*Illinoia pisi* Kalt.) is reported in outbreak numbers in parts of Kansas, northeastern Arkansas, Arizona and Southern California. Isolated infestations were reported from Mississippi. The infestation reported from the Willamette Valley of Oregon increased materially during late March.

Damage by the shot-hole borer (*Scolytus rugulosus* Ratz.) is reported to be unusually severe in Ohio this spring. In view of the very extensive and serious drought of 1930, it is surprising that severe damage by this insect is not more extensively observed.

The first record for 1931 of the pupation of the codling moth (*Carpocapsa pomonella* L.) was made in Missouri on April 3; at Cornelia, Georgia, April 15; at Carbondale, Ill., April 12; at Urbana, Ill., April 14; in Nebraska, April 13; in Pennsylvania, April 21; and in Maryland, April 21. The insect is quite generally reported as normally abundant throughout the Middle Atlantic, South Atlantic, and East Central States. In the Rocky Mountain region the insect is reported as very abundant in New Mexico, and as having sustained a very slight mortality in Idaho.

The Eastern tent caterpillar (*Malacosoma americana* Fab.) appears to be normal in numbers throughout the New England, Middle Atlantic, and South Atlantic States.

Deciduous fruit aphids are reported as quite generally below normal in numbers along the Atlantic Seaboard from Massachusetts to Georgia, and westward to Missouri. Reports of an unusual abundance of deciduous fruit aphids have been received from Mississippi. A limited heavy infestation of the apple grain aphid (*Rhopalosiphum prunifoliae* Fitch) is reported from New York State, and owing to the unusually mild winter the woolly apple aphid (*Eriosoma lanigerum* Hausm.) was as numerous during the first week of April in Wanatchee, Wash., as they were in July of last year.

Apple leafhoppers are reported as unusually abundant in Connecticut and the East Central States. They are so numerous in parts of Missouri that the fruit growers are becoming alarmed.

The first emergence of the oriental fruit moth (*Laspeyresia molesta* Busck.) to be reported from Georgia was on April 8, at Thomaston. Adults were observed at Roanoke, Va. on April 14.

A very heavy migration of the common red spider (*Tetranychus telarius* L.) into fruit trees in western Washington indicates that the very serious outbreak of last year may be repeated this season.

The plum curculio (*Conotrachelus nenuphar* Hbst.) appears to be delayed in emergence in the South Atlantic States. Only 3 beetles were collected at Thomaston prior to April 4, on which date 35 adults were collected in two hours by jarring. This is about three weeks later than general emergence last year and the latest emergence in 11 years. Adults were observed for the first time on April 14 in Virginia and southern Illinois, and on April 15 in Kentucky.

Heavy infestations by the rusty plum aphid (*Hysteronneura setariae* Thos.) are reported from Georgia and Mississippi.

The grape leafhopper (*Erythroneura comes* Say) is more abundant than usual in the commercial grape sections of northern Ohio. Damage from this insect is more abundant than ever before recorded in the San Joaquin Valley, California.

and in the central part of the Valley the insects are so numerous that the small leaves are turning brown.

A severe outbreak of the six-spotted mite (*Tetranychus sexmaculatus* Riley) has occurred over the entire citrus belt of Florida and some defoliation has resulted where spraying has been neglected.

The vegetable weevil (*Listroderes obliquus* Gyll.) continues to be a serious pest on a variety of truck crops in Mississippi.

The first adult of the spotted cucumber beetle (*Diabrotica duodecimpunctata* Fab.) to be observed in Virginia this season was seen at Norfolk on April 3, and the first adult was reported from Illinois on April 15.

The western spotted cucumber beetle (*Diabrotica soror* Iæc.) is making serious inroads on fields of seedling clover in the Willamette Valley of Oregon, and is doing considerable damage to melons in the San Joaquin Valley of California.

The Colorado potato beetle (*Leptinotarsa decemlineata* Say) is reported as unusually abundant in the Chadbourn district of North Carolina, and in the Norfolk district of Virginia. There is also quite a heavy infestation by this insect as far south as Alachua County of Florida.

The seed corn maggot (*Hylemyia cilicrura* Rond.) is not so serious as usual on potato seed pieces in the trucking sections of Virginia and the Carolinas, although it is reported as causing considerable damage to snap beans in North Carolina, and doing considerable damage to corn, peas, and beans in western Texas.

The cabbage webworm (*Hellula undalis* Fab.) became so numerous on turnip greens about Lucedale, Miss., that canning operations had to be suspended.

Large quantities of spinach harvested early in April had to be rejected on account of the unusually heavy infestation by the green peach aphid (*Myzus persicae* Sulz.) in the Norfolk district of Virginia.

The first adult of the harlequin bug (*Murgantia histrionica* Hahn.) to be observed in Virginia this season was collected April 9. The first specimen observed in the Chadbourn district of North Carolina was recorded as of April 21.

Italy: New Observations (1).

Fungi. — During last winter and the spring of the present year no new diseases of crop plants were reported, but here and there there were further outbreaks of varying severity of those already noted; these were favoured for the most part by the somewhat unseasonable weather in various parts of Italy, in which mild periods alternated with periods of cold and rain until and throughout May.

The wheat has been and is, however, spoilt by the 'foot rot' caused sometimes by *Leptosphaeria*, sometimes by *Ophiobolus*; in the province of Rome *Puccinia glumarum* has been particularly widely spread, specially on the early 'Mentana' wheat, though serious infection with *P. graminis* has not yet been observed; the first report of *P. triticea* was on hard 'Senatore Cappelli' wheat on 15 April, which is considerably later than in past years.

Canker of apple and pear trees due to *Nectria ditissima* has been somewhat frequent in Piedmont this year.

Vegetables belonging to the family of the Compositae, and lettuce in particular, have in various parts of Italy been attacked by *Bremia Lactucæ*, without however there being serious loss of the produce.

(1) Communication from the Royal Station of Plant Pathology, Rome, official correspondent of the Institute.

Until April infection with *Ascochyta Pisi* and *Peronospora Viciae* was observed on peas, the former being particularly serious as it threatened the pods.

Cultivated roses under glass and in the open have suffered much from *Botrytis* which attacked the flower buds and to an even greater extent the leaves, making the plants of little commercial value.

Napicladium Tremulae (*Didymosphaeria populina*) on Canadian poplars in Piedmont, though less severe than last year, is always present to some extent.

Young chestnut plantations were found to be affected with *Phytophthora cam-bivora* in the following communes of the province of Cuneo. — Monastero Vasco, Frabosa Sottana (divisions Alma, Riosecco, Griseri dell'Alma and Pianvignale), Montalto di Mondovì (regions Oberti and Costande) and Monasterolo Cirsotto.

In certain places the wet season has favoured infection with various species of Erysiphaceae, without however causing appreciable losses.

Bacteria. — Some particularly noteworthy bacterial affections of tobacco, caused by *Pseudomonas pseudozooglaeae*, and of potatoes, caused by *Bacterium Solanacearum*, were observed in the districts of Iccco and Udine.

In various localities near Cervignano bacterial mulberry blight (*Bacterium Mori*) continues to appear. A rot of gladiolus bulbs set up by *Bacterium marginatum* has caused some damage in gardens near Rome.

Insects. — In the neighbourhood of Rome this spring *Thaumetopoea pityocampa* was observed even in localities where few ornamental pines are grown; active control measures immediately undertaken will undoubtedly in future years restrict the damage to those pines already affected and will check further spread.

Wheat has been seriously damaged by Thripidae in various parts of Italy (Sardinia, Sicily, Rome, Veneto, etc.); the ears were much spoilt by the abortion of numerous spikelets, often whole ears being reduced to only the axis.

Many plants were injured by Aphididae, to perhaps a greater extent than in past years. Amongst the species most affected were roses, plums, peaches, wheat, etc.

In Piedmont the presence of the larvae of a Curculionid (*Larinus*) was reported on the inflorescence stalks of artichokes; often when the insects were in great numbers the stalk was broken through.

In the province of Rome this year there was a considerable invasion of Moroccan locusts (*Doclostaurus maroccanus*) coming from eggs deposited last year. The zones most affected up to the present are the communes of Anzio, Nettuno, Cisterna, the Agro Romano included in these communes, the part of Sezze in the plain and the commune Terracina. In the greater part of the region the damage was confined to the natural pasture; in other places (Anzio, Agro Romano) the locusts have invaded or menaced crops of wheat, other cereals and lucerne. Control was carried out according to Government regulations by catching the insects with tents and poisoning the zones with solutions of sodium arsenite; certain owners of pastureland prefer using naphtha.

Mites. — A parasitic mite, *Eptitrimerus piri* Nal., not previously recorded has recently been found in nurseries and orchards in the province of Ravenna; it damages the young shoots of pear trees.

Non-parasitic diseases. — Many cases of 'ginocchiatura' have been again this spring reported on early 'Mentana' wheat in various districts. The affection appears less frequent than in the past year, but perhaps owing to the increased attention paid to it seems more widely distributed.

Another affection of wheat, perhaps due to weather conditions, is a variegation of the leaves with longitudinal white stripes of varying width. This var-

tion is apparent mostly on hybrids such as the early 'Mentana' and 'Edda', wheats and to a less extent on 'Ardito' and 'Balilla'. It has been particularly noticeable this year in the provinces of Piacenza, Parma and Pavia.

The fall of fruit buds of the peach (var. 'Mayflower' and 'Amsden') has continued to occur, specially in the vicinity of Rome. A study of this disease is in progress; it seems, however, that the agency of parasites must be excluded and that the trouble is due rather to particular conditions of soil, cultivation and weather.

A suberisation of potato tubers, probably caused by the weather, has been noted. A browning of the centre of the potato, which has been observed with some frequency near Rome and in Apulia, has been regarded as due to virus disease which often causes necrosis and consequent browning of tissues. Experiments have been initiated to test this hypothesis.

Nigeria: Locust Invasion (1).

As mentioned in my previous communication (see this Bulletin, 1930, pp. 85-86) swarms of *Locusta migratoria migratorioides*, R. & F., occurred in various parts of Nigeria between early December, 1929, and the end of February, 1930. Information from various native sources has established the fact that a similar large scale invasion took place about 35 years ago.

The first hopper band was found near Iseyin in the Oyo Province on March 31st, 1930, and during April and the first half of May there was a heavy infestation of hoppers in both the Oyo and Abeokuta Provinces (south-west Nigeria). In April hopper bands were very numerous in the Benue Province and by the end of May had been reported from all of the remaining ten Provinces in the North, although they were then infrequent in the three most northerly Provinces, viz. Sokoto, Kano and Bornu. The first report of hoppers becoming adult was received from the Abeokuta Province on May 3rd. During May and June most of the daughter swarms which had survived the anti-hopper campaign flew in a north-easterly direction; from the last week of May to mid-July many swarms entered the Sokoto Province from the west and proceeded in an easterly direction. Many of the daughter swarms bred in the vicinity of Lake Chad and Mr. O. B. Lean, Entomologist, organised a poisoned bait campaign on the Nigerian shores from mid-August to mid-October in the course of which some 7,300 acres of hoppers were destroyed. During September, October and November hoppers appeared in nearly all of the Northern Provinces and it is evident that very many of the daughter swarms did not participate in the general concentration of swarms in the Chad area. In late September and October Mr. Lean observed many swarms of the new generation (third) entering the Bornu Province from the east, and with the onset of the north-east wind in the latter month swarms commenced to fly to the south-west. By the end of November they had reached the south of the Abeokuta Province in the west and Calabar in the east. From December, 1930, to March, 1931, sexually immature swarms of the third generation have been principally concentrated in the Southern Provinces, Ilorin and Benue.

During the 1930 anti-hopper campaign most of the usual control methods were utilised, viz. trenching, barriers, spraying and poisoned bait. During the coming campaign which is expected to commence very soon, the poisoned bait method

(1) Communication from the official correspondent of the Institute, Mr. F. D. COLSON, M.A., F.E.S., Senior Entomologist, Agricultural Department, Ibadan, Nigeria.

is to be the principal measure for combatting hopper bands, and arrangements have been made for the establishment of bait factories at suitable places throughout Nigeria. The organisation of the campaign in the Northern and Southern Provinces is in the hands of the respective Assistant Directors of Agriculture. The bait to be used consists of bran, chaff or sawdust steeped in a solution of sodium arsenite in water, the proportions being approximately 12 oz. of poison, 8 gallons of water and 30 lbs. of base.

In February a mission proceeded to Dahomey and Colonie du Niger in order to discuss anti-locust measures with the French authorities in those two colonies. During the Chad campaign (mentioned above) a French official visited the scene of operations to confer with Mr. Lean.

Yugoslavia: Crop Pests (1).

During the last year and the early part of this a diminution has been noted in the damage to plum orchards caused by *Eulecanium corni* Bouché. The dry and mild spring of 1930 was very unfavourable for the development of the larvae after hibernation. The invasion of scale insects has during five years assumed catastrophic proportions; ten million trees of *Prunus domestica* have been killed. At the present time the intensity of the invasion has been reduced by $\frac{4}{5}$, with a corresponding reduction in the damage.

In the eastern districts this spring *Loxostege sticticalis* L. has caused injury to lucerne, beet and maize; the losses amount to 2,500,000 'dinars'.

In the same districts *Cricetus cricetus* L. and *Citellus citellus* L. have caused serious loss.

The fine spruce forests in Bosnia have for three years been attacked by *Scolytidae*. The Government has voted a sum of 10 million 'dinars' for the organisation of the control of the beetles. In all the pine forested regions *Lophyrus rufus* Rtz. has made its appearance in menacing numbers.

LEGISLATIVE AND ADMINISTRATIVE MEASURES

Germany (Saxony) (2). — An Order of 12 March 1931 — 36 VII — from the Ministry of National Economy instructs the rural and urban Communes to take such measures as are necessary to control the diseases and pests of fruit trees. They will be supplied free of charge with the necessary explanatory leaflets on request.

The Order also provides for the control of diseases and pests of asparagus. To ensure a general and uniform control of *Puccinia Asparagi*, *Platyparaea poeciloptera*,

(1) Communication from the official correspondent of the Institute, Dr. Mihaljo Guranovic, Maître de Conférences à la Faculté d'Agronomie et de Sylviculture, Belgrade.

(2) Communication from the Biologische Reichsanstalt für Land- und Forstwirtschaft, Berlin, official correspondent to the Institute.

Crioceris asparagi and *C. 12-punctata* it is required that all asparagus stems must be cut and burnt in the field before the end of October every year; any remaining must be pulled up and burnt during the winter (before the end of February); in the harvesting of seed attention must be paid to the productivity and resistance to diseases and pests of the mother plants; the resistance of the plants must be strengthened by applying suitable complete fertilisers, by careful tillage and well-spaced planting (200 × 50 cm) and by correcting soil reaction.

Pucc. Asparagi should be controlled by planting only varieties recognised as rust-resistant in the locality. Bordeaux mixture sprays may also be applied.

It is recommended for the control of *Platyparaea* to cut back to the crown any shoots which are twisted or unhealthy in colour and, since the pest prefers sunny places, to shade the plants.

Young *Crioceris* may be removed by rubbing the plants lightly with the hand from time to time. The beetles or larvae may also be shaken into bowls containing a little petrol. The best method however consists in applying arsenical sprays. The beetles may be caught in winter when they seek shelter by means of corrugated paper bands such as are used to protect fruit trees.

Spain. — With a view to making uniform the official certificates issued by the Phytopathological Service at the ports and frontier stations, the Minister of National Economy has by the 'orden' of 21 May 1931 provided that — except in cases where special models are required by certain countries and accepted by Spain — such certificates shall conform to the model annexed to the present 'orden'. [This model itself conforms to that scheduled by the International Convention for Plant Protection, Rome, 16 April 1929. Cf. this *Bulletin*, 1929, p. 55]. (*Gaceta de Madrid, Madrid*, 3 junio 1931, año CCLXX, tomo II, núm. 154, págs. 1166 y 1167).

France. — A Ministerial Decree of 15 April 1931 indicates the distribution among the twenty-seven phytopathological circumscriptions of the country, of the horticultural and viticultural firms and the exporters of agricultural produce of plant origin which are inscribed for 1931 on the control lists of the Service of Plant Protection and Phytopathological Inspection, and specifies the inspectors, agents, assistants and controllers of the said Service for 1931. (*Journal Officiel de la République Française*, Paris, 22 mai 1931, LXIII^e année, n° 119, p. 5641-5644).

Mexico (1). — With a view to preventing the introduction of the two wheat diseases known in the United States of America under the names of 'flag smut' (*Urocystis Tritici* Koern.) and 'take all' (*Ophiobolus graminis* Sacc.) as well as of other serious diseases, not yet known in the Republic, changes have been introduced by a Presidential Decree dated 4 March 1931 in the 'Cuarentena Exterior número 8' (cf. this *Bulletin*, 1929, No. 3, pp. 39-40 and No. 4, p. 57) as follows:—

(a) A 'Cuarentena Exterior absoluta' is proclaimed whereby is prohibited the importation of all species and varieties of wheat;

(b) The importation of wheat may be allowed by special permit when required for study purposes or scientific research, provided that such precautions are observ-

(1) Communication from the official correspondent of the Institute, Dr. Alfonso Baamre, Jefe del Departamento de Investigación de Plagas, Oficina Federal para la Defensa Agrícola, San Jacinto, D. F.

ed as are required by the 'Secretaría de Agricultura y Fomento' through the 'Oficina Federal para la Defensa Agrícola'.

The present 'Cuarentena' will be applied on and from 6 March 1931.

*. For the purpose of preventing the introduction of the European corn borer ('barrenador europeo del maíz', *Pyrausta nubilalis* Hb.) a Presidential Decree was issued on 25 March 1931 applying the 'Cuarentena Exterior número 11' to come into force on the 28th March whereby the importation is absolutely prohibited of:—

- (a) Maize in the grain or in the cob and of any other part of the plant (stalks, leaves, etc.);
- (b) Broom corn (any part of the plant);
- (c) Any variety of sorghum (any part of the plant);
- (d) 'Zacate del Sudán' [Sudan grass] (any part of the plant);
- (e) Celery and rhubarb, dry or fresh, and beet with tops;
- (f) Cut flowers or whole plants of *Chrysanthemum*, *Aster*, *Cosmos*, *Zinnia*, *Malva*, *Hydrangea Hortensia* and cut flowers or whole plants of *Gladiolus* and *Dahlia*, except bulbs and roots of the last named plants without stems;
- (g) Straw of all cereals and Graminaceae whether as such or used for packing.

The importation of the above mentioned plants and agricultural produce may be allowed by special permit for study and scientific work provided that such precautions are observed as are required by the 'Secretaría' through the 'Oficina'.

Any breach of the present regulations will be punishable by a fine of 10 to 1000 'pesos' payable by the consignor, as well as by any one conveying the goods, which will be destroyed without compensation.

If a really effective process for the sterilisation and fumigation of plants and of the above named agricultural products be discovered, the 'Secretaría' may apply the 'Cuarentena parcial' in lieu of the 'Cuarentena absoluta'.

Special instructions are appended to the said Decree, bearing the date of the 7th April 1931, which shall be observed by the inspectors of the 'Oficina' in connection with the use of straw, of any cereal and Graminaceous plant for the packing of commercial products. Inspectors may permit the entry of goods packed with straw and shipped to Mexico before the enforcement of the 'Cuarentena Exterior número 8'.

During the present year importers may in any Mexican port or frontier post exchange the straw used for packing (which will be burned) for another product or material which can replace it, or submit the goods to fumigation with carbon bisulphide, hydrocyanic gas, etc. in accordance with the present regulations and taking all necessary precautions when treating foodstuffs not packed in metallic or glass vessels.

The quantities of carbon bisulphide or of hydrocyanic gas to be used for fumigation purposes are fixed, as is the duration of the treatment. Any expenses incurred shall be borne by the importer.

The following are the ports and frontier posts by which importation may be allowed:—

On the northern frontier: Zaragoza, B. C.; Mexicali, B. C.; Nogales, Son.; Agua Prieta, Son.; Juarez, Chih.; Piedras Negras, Coah.; Villa Acuña, Coah.; Nuevo Laredo, Tamps.;

On the coast of the Gulf of Mexico: Tampico, Tamps.; Veracruz, Ver.; Alvarado, Tab.; Progreso, Yuc.; Payo Obispo, Q. R.;

On the southern frontier: Suchiate, Chis.;

On the Pacific coast : Ensenada, B. C. ; Mazatlán, Sin. ; Manzanillo, Col. ; Acapulco, Gro. ;

All other ports and frontier posts which the 'Secretaría' may consider it necessary to authorise.

The 'Secretaría' will in good time make known the regulations, which shall apply on and from the 1 January 1932.

Réunion (Island of). — By Governatorial Decree No. 15, dated 6 January 1931, authorisation for the importation, circulation, storage and transit of plants, sets and seeds of sugar cane may be allowed, subject to the conditions specified in Art. 2, paragraph 4 of the Ministerial Decree of 3 December 1929 (see this *Bulletin*, 1930, pp. 89-90), only by the port of Pointe des Galets. (*Revue Agricole de l'Ile de la Réunion*, Saint-Denis-Réunion, 1931, 2^{ème} sér., XIX^e année, n° 1, p. 25-26).

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Introduction (pp. 5-7).

Part. I. The physical factors of insect life. — I. Heat (pp. 7-68). II. Humidity (pp. 68-74). III. Other climatic factors (pp. 74-80). IV. Combinations of several factors (pp. 80-86).

Part. II. Weather, climate, and insects. — V. Relations of weather to the activities of insects (pp. 87-99). VI. Daily and annual cycles (pp. 99-115). VII. Climate and distribution (pp. 116-136). VIII. Effect of climate on abundance (pp. 136-162). IX. Climate and weather in economic entomology (pp. 162-186). Bibliography (pp. 187-232). Index to authors (pp. 233-238). Subject index (pp. 239-247)].

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NOTES

International Competition for a Method of Controlling the Root Rot of Citrus Plants. — The last date for entering this competition organised by the 'Camera Agraria' of Messina, Italy (cf. this *Bulletin*, 1930, p. 96), has been postponed to 31 March 1932.

INTERNATIONAL BULLETIN OF PLANT PROTECTION

DISCOVERIES AND CURRENT EVENTS *

Algeria : Desert and Moroccan Locusts (1).

Although last year Algeria was the scene of a formidable invasion of desert locusts (*Schistocerca gregaria* Forsk.) in 1931 they have been reported only in certain communes in the vicinity of Tlemcen. They made their appearance at the beginning of March in the mixed commune of Marnia. Egg laying took place first at Kef (Mixed commune of Marnia) and in the douar of Tameksalet over about 10 sq. kilometres. The flight then followed down the Tafna and eggs were laid successively round Hammam-Bougrara (Marnia and Remchi), at Oulad Riah (Remchi) between the Ain Berdil and the Ain Romana (right bank of the Tafna), at Beni-Mishel (Nédroma), on both banks of the Tafna and finally in the plain of Remchi and from there to the sea.

Control measures were carried out in optimum conditions and gave excellent results everywhere ; the damage was confined to certain hectares of young vines, the leaves of which were eaten.

The interesting conclusion may be drawn that poisoned bait allows of an effective control of winged locusts and not only of hoppers. This method, which had already been experimented with successfully in 1930 at Nédroma and Turenne, gave complete satisfaction this year at Beni-Saf. If used immediately on the arrival of the locusts it should make it possible in future to reduce considerably the size of the locust swarms which by successive stages will gradually gain the cultivated districts of the uplands of the Tell.

* * *

As a result of the efforts expended for nearly four years the areas invaded by Moroccan locusts (*Dociostaurus maroccanus* Thunb.) in Algeria have progressively and rapidly decreased. During the spring of 1931 control measures were confined to the south of the department of Algiers (Mixed Commune of Ain-Boucif) and to the north of the Annexe of Djelfa (Tribes of the Oulad ben Abdallah and the Oulad Abdel Kader). Some small centres occurred also in the mixed Commune of Saïda.

At Ain-Boucif the records of laying showed the existence of a contaminated area of 100 ha. distributed among various small patches in the douars of Zemach and Oueltes Sél. In the Annexe of Djelfa about 300 ha. were registered.

* The Bulletin of the International Congress of Entomology, 1931, is published in French, English, German, Italian, Spanish, and Chinese. The Bulletin of the International Congress of Plant Protection, 1931, is published in French, English, German, Italian, Spanish, and Chinese.

Hatching began in these two regions at the beginning of April and continued until the 20th.

Control was actively carried out from the first with a quantity of native labour by means of burning alfa and poisoned bran. The result was absolutely complete destruction and on 25 May the gangs were disbanded, all the locusts having been destroyed.

Egypt: Occurrence and Movements of Desert Locusts (*Schistocerca gregaria*) (1).

The sexually mature locusts which entered Sinai late in April 1931 and reached the South Western part of the Peninsula together with others coming from the East on May 12, remained roaming about in S. Sinai for a short time when they crossed the Gulf of Suez and appeared at Hurgada and other posts on the Red Sea coast.

Shortly afterwards they were flying to the S. West and were reported from Kena and Assuan.

In two cases they reached the cultivation in these Provinces.

No egg-laying has so far taken place. The present conditions availing in the desert are not quite favourable for breeding, the valleys being dry with only scanty vegetation.

At about the end of the month, May 26, red invaders penetrated into Sinai via Ras el Nagb and Kuntilla, two paths North of Adaba usually followed by locusts. One swarm about 4 kilometres long continued its flight to the S. W., crossed the Sea and settled at W. Belihn N. W. of Hurgada, where it is now combatted. Later on others came direct from the East, most probably from Arabia, and reached the Eastern Desert between Mosseir and Hurgada.

On the 31st the vanguards of these swarms appeared on the borders of Kena and Assuan.

The scouting of different desert regions has been going on all the time. This work has been accomplished in S. Sinai. The mature locusts left no trace except the eaten leaves of the orchards round the monastery.

One fighting party has been stationed at Hurgada, another is on the way to this spot.

Flame guns and kerosine have been dumped in Sinai as well as in the agricultural centres at Kena and Assuan to combat any locusts that might appear.

Eritrea: Desert Locusts (*Schistocerca gregaria*) (2).

In April 1931 large swarms of locusts flew towards the territory of the Colony from beyond the Abyssinian frontier.

On 6 April numerous locusts coming from Safò (Tigrà), after crossing the Mareb flew in the direction of the Seraè and alighted in the territories of Chenafenà Gher-sunila, Haleuat, Merad Lam and Addis Addi; on the 7th they took flight again towards Ganà (Hazamò) from where they flew in an easterly direction.

In the first decade of April new centres of hoppers were continually being re-

(1) Communication from the Chief Plant Pathologist, Plant Protection Section, Ministry of Agriculture, Cairo, Egypt, to the International Institute of Agriculture.

(2) Communication from the official correspondent of the Institute, Dr. A. De Fumagalli, Chief of the 'R. Ufficio Agrario' of Eritrea, transmitted by the Government of the Colony.

ported in the Agambussa: in the localities of Macalà, Mercà, Maaggarò, Gumredagà and in the territory of Mensa Bet Sciacan. On the 9th a swarm coming from Liban passed over Scicchetti flying first in a northerly and then in a southerly direction.

On 13 April a small group of red locusts coming from the eastern plain was observed at Mai Ela, Adi Comté, Metaten, Addis Addi and Halai; a swarm coming from Zula was also reported flying towards the Agametta. Yellow locusts coming always from the eastern plain came to ground on the 20th on the high plateau of Cohaitò.

From the movements recorded during April it is apparent that the summer cycle of invasions of the Colony is started by locusts coming from Abyssinia. These numerous swarms which invade the high plateau are a continual source of danger in spite of a careful watch being kept and many of them being destroyed. The swarms coming from the eastern plain may be regarded as negligible in comparison.

United States of America: Outstanding Entomological Features (1).

The following notes refer to May, 1931.

Probably the most serious insect development of the month is the severe armyworm (*Chorizagrotis auxiliaris* Grote) outbreak occurring over 11 counties in north central Texas. A similar outbreak is under way in Mississippi and Kentucky with lesser outbreaks in eastern Arkansas and the eastern shore of Virginia.

Cutworms seem to be unusually prevalent along the Atlantic Seaboard. These insects are also very troublesome this spring in the East Central States, and westward to Montana, the Dakotas, and Nebraska. The remainder of the country is experiencing about the normal cutworm damage.

During the first week in May grasshoppers' eggs were found to be very numerous in South Dakota and at that time began hatching in Montana and Nebraska. By the third week in the month, hatching was reported from the Great Basin. The Salt River Valley of Arizona and the Antelope Valley and the Klamath Lake district of California are having localized grasshopper outbreaks.

Owing to the cool weather of late spring considerable wireworm injury was reported from scattered localities throughout the United States.

As a whole, the Hessian fly (*Phytophaga destructor* Say) situation does not seem to be alarming, although Illinois reports that from 32 to 40 per cent. of the tillers are infested in certain fields.

The chinch bug (*Blissus leucopterus* Say) situation in Illinois, Missouri and parts of Kansas appears to be rather serious. Large numbers of the bugs are in the fields, and in some cases in Illinois are killing wheat, while in Kansas reports of the killing of a lot of oats by this insect have been received.

The corn ear worm (*Heliothis obsoleta* Fab.) is commencing to appear in destructive numbers in the Gulf States.

A very unusual and severe attack of one of the tiger moths (*Apantesis phalerata* Harr.) is reported from south-central Tennessee. The Lincoln County agent estimates that in that county alone 500 acres of corn are destroyed, and many pastures are completely stripped of vegetation.

(1) Communication from the official correspondent, Mr. J. A. Hyslop, Senior Entomologist in charge, Insect Pest Survey, transmitted by Mr. G. E. Matthews, Chief, Bureau of Entomology, United States Department of Agriculture, Washington, D. C.

The alfalfa weevil (*Phytonomus posticus* Gyll.) is so abundant in western Nevada as to necessitate control measures.

During the latter half of the month adult codling moth (*Carpocapsa pomonella* L.) were emerging in the Middle Atlantic States. In the southern part of this section the emergence is considerably later than last year. In the Eastern Central States winter survival seems to be somewhat higher than last year, emergence in this section occurring at about the same time as last year. In the Pacific Northwest emergence occurred during the first week of May, while in California the peak of emergence in the Antelope Valley was on April 10.

The fruit aphid situation has not materially changed since last month. The rosy aphid and apple grain aphid increased slightly in abundance toward the end of the month.

Apple leafhoppers continue to be unusually numerous in New England, and are doing serious damage in the Hudson River Valley in New York State.

A rather unusual outbreak of the striped cucumber beetle (*Diabrotica vittata* Fab.) as an apple pest has developed in Mississippi. This was first observed last year when this insect, by feeding on the blossoms, ruined a large part of the crop in the northeastern part of the State. This year the insect has again attacked the blossoms but not so seriously as last year.

The European red mite (*Paratetranychus pilosus* Can.) started hatching during the first week in May in New England and the Middle Atlantic States. Abundance does not seem to be unusual.

The oriental fruit moth (*Laspeyresia molesta* Busck) on a whole does not seem to be unusually abundant in its range this season.

The plum curculio (*Conotrachelus nenuphar* Host.) is not abnormally abundant throughout the New England, Middle Atlantic, and South Atlantic sections. On the whole emergence is later than usual, and in Georgia the infestation is the lightest in the past 13 years.

The grape leafhopper (*Erythroneura comes* Say) is reported as unusually abundant in southern New Jersey and in eastern Virginia.

Heavy infestation of pecan by the hickory phylloxera (*Phylloxera caryaecaulis* Fitch) was reported from the Gulf section and this insect was doing serious damage to trees in Louisiana.

The pecan case bearer (*Mineola indiginella negulella* Riley) was very injurious during the first half of the month in Mississippi and Texas.

The infestation of the six-spotted mite (*Tetranychus sexmaculatus* Riley) in Florida is rapidly decreasing, apparently owing to a fungus disease.

By the middle of the month the striped cucumber beetle (*Diabrotica vittata* Fab.) put in its appearance in the southern part of the Middle Atlantic States, and was recorded as quite generally abundant and destructive throughout the eastern part of the United States, westward to Nebraska, Oklahoma, and Mississippi.

The first adult of the spotted cucumber beetle (*Diabrotica duodecimpunctata* Fab.) was observed in Maryland on April 5, and in Kansas on May 19.

Flea beetles on truck crops occasioned considerable injury in New York and New Jersey.

During the cool weather of May the seed corn maggot (*Hylemyia cilicrura* Rond.) did considerable damage to bean and cucumber seed in Virginia, to corn and beans in Illinois, and to similar crops in Kentucky, Missouri, parts of Kansas, and Utah.

The potato tuber worm (*Phthorimaea operculella* Zell.) has been unusually abun-

dant in parts of Los Angeles County, Calif., this year, and was reported from stored potatoes at Newark, Del.

By the middle of the month reports of serious infestation by the cabbage aphid (*Brevicoryne brassicae* L.) were received from New Jersey, Virginia, Ohio, and Indiana. In some cases the infestations are suspected as having originated on plants shipped from the South. Very heavy infestations of cabbage by the cabbage aphid were also reported from Mississippi.

Rather heavy infestations of the harlequin bug (*Murgantia histrionica* Hahn) were reported from the southern tip of New Jersey during the month. In the Norfolk district of Virginia eggs of this insect were numerous in the field during the last week in April, and the first nymphs were observed on May 12.

The State Plant Board of Mississippi reports that the strawberry weevil (*Anthonomus signatus* Say) was found seriously infesting strawberries in the southeastern part of the State. This is the first record of this insect in Mississippi.

During the last week in May the Mexican bean beetle (*Epilachna corrupta* Muls) appeared in the fields in the southern part of New Jersey, and on the eastern shore of Maryland. During the first week in the month the insect was observed in the Norfolk district of Virginia. This insect is causing considerable damage at the present time in North Carolina and has extended its range southward to Albany, Ga. Except for the isolated infestation at Thomasville, Ga., this is 37 miles south of where it was recorded last year.

Canker worms are reported as somewhat more abundant than usual in the New England States. Similar reports have been received from Minnesota and Kansas.

One of the worst outbreaks of the forest tent caterpillar (*Malacosoma disstria* Hbn.) ever recorded is under way in central Virginia. Complete defoliation of forest trees has been observed over considerable areas.

The larch case bearer (*Coleophora laricella* Hbn.) is heavily infesting the larch of New Hampshire, Vermont, and parts of Pennsylvania. Heavy stands appear as if scorched by fire owing to the feeding of this insect.

The European pine shoot moth (*Rhyacionia buoliana* Schiff.) is becoming generally prevalent in southern New England, southern New York, New Jersey, and Pennsylvania. So far the infestations are all confined to nurseries, and transplanted trees. The Nantucket pine shoot moth (*Rhyacionia frustrana* Comst.) is reported as doing serious damage to several species of pine in a nursery in the Philadelphia district of Pennsylvania.

Finland: *Bacterium maculicolum* (1).

The presence of *Bacterium maculicolum* McCulloch in Finland has been found by Dr. V. Krohn of Helsinki. He has succeeded in infecting seedlings of cauliflower and Brussels sprouts with pure cultures, but the common cabbage was not attacked. The disease would appear to be already somewhat widely distributed in southern Finland (Turku, Helsinki, Hämeenlinna, Hamina).

India: Plant Diseases in Burma (2).

There was a severe attack of mosaic disease on chillies (*Capsicum annum*) during the last season 1930-31. The cause and the vectors of the disease are being investigated. No control measures are possible at present.

(1) Communication from the official correspondent of the Institute, Prof. J. Ivar LUND, Director of the Plant Diseases Section of the Agricultural Experiment Station, Helsinki.

(2) Communication from the official correspondent of the Institute, Mr. U THANT SO, B. Agr. D., I. C., Mycologist, Burma, Mandalay.

The sterility of pigeon pea (*Cajanus indicus*) accompanied by a proliferation of smaller leaves occurred with a greater intensity than in the last year. The cause of the disease is not yet known.

Italian Somaliland: Desert Locusts (*Schistocerca gregaria*) (1).

2 January 1931 – Zone of Mahaddei and Villagio Duca degli Abruzzi: numerous swarms flew over the zone.

4 January 1931 – Oddur: a great number of locusts flew over the zone from the north-east. Alighting on the 'sciambe' they caused considerable damage.

6 January 1931 – Residence of Baidoa: huge swarms crossed the zone destroying the crops.

8 January 1931 – Commissariat of Oddur: to the north of Uegit numerous swarms caused damage to the Guinea corn.

9 January 1931 – Commissariat of Oddur: numerous locusts crossed the zone from the east in a northerly direction.

10 January 1931 – Commissariat of Baidoa: in the zone between Baidoa and Oddur enormous damage was caused by locusts to Guinea corn.

13 January 1931 – Residence of Afgoi: numerous swarms coming from the south-west flew in an easterly direction.

16 January 1931 – Commissariat of Villabruzzi: numerous locusts coming from the north crossed the zone following the course of the river.

29 January 1931 – Tohen: passage of a dense swarm of locusts. No damage.

18 April 1931 – Residence of Oddur: a locust swarm passed at a great height over Oddur coming from the N. E. and flying to the south.

14 May 1931 – Residence of El Bur: locust swarms from north flying south.

16 May 1931 – Territories of Beletuen: great swarms from N. W., flying S. E.

17 May 1931 – Residence of Itala: various swarms from north flew slowly southwards. The largest alighted in the zone and laid eggs.

28 May 1931 – In the territory between Oddur and Lugh Ferrandi many hatchings took place.

1 June 1931 – Residence of Lugh Ferrandi: hatching reported almost everywhere.

12 June 1931 – Residence of Oddur: numerous swarms.

The damage was on the whole of little importance. The invasions were combated with spraying and other control methods.

Jugoslavia: Serious Sugar Beet Crop Losses (2).

The sugar beet crops in Jugoslavia have been badly damaged this year. The most seriously affected regions were Slavonia and Osijek, where the intensive cultivation of beet is widespread.

Unfavourable weather coinciding with the ravages of pests and fungi have affected nearly all the fields, in some cases to such an extent that it was necessary to re-plough.

(1) Communication from the Ministry for the Colonies ('Ufficio Studi e Propaganda'), Rome, to the International Institute of Agriculture.

(2) Communication from Dr. Mirko Korić, Director of the Royal Agricultural Experiment Station, Osijek, to the International Institute of Agriculture.

The cold and wet spring delayed sowing until April, the normal planting season being 10 to 20 March. The young plants grew slowly on account of the continued bad weather and by reason of their retarded growth were seriously attacked by the 'Wurzelbrand' fungi, which occur somewhat widely in the soil of this region but in normal years cause insignificant loss. Then the already stunted and sickly crops were invaded by various pests, amongst which a weevil (*Cleonus* [*Bothynoderes*]) must be mentioned, which appeared in numbers such as had never previously been seen, and certain Chrysomelids (*Psylliodes attenuata* and *Chaetocnema concinna* in particular). These occurred in such numbers that all control measures were of no avail. Poison sprays, which were applied in the strongest concentration possible (two or three times the normal strength), were unable to save the crops, because the insects always appeared again in millions and in the end caused catastrophic damage. On all sides the beet fields showed scarcely a trace of green.

Every means of protecting and saving the crop was tried because in spite of present prices and the trade crisis the sugar beet plantations are still remunerative.

Immediately after sowing the beet fields were surrounded with trenches to check the invasion of young *Cleonus* and other non-flying insects. Then the picking of the weevils was begun. But their numbers were such that on one farm 2500 litres were collected from 150 ha. and on another 3,300 litres from 50 ha. Millions of insects were killed by the sprays, by turkeys and ducks, by burning with petrol flame-throwers and by crushing. But the preventive and control measures, of which the cost was enormous, were all without decisive result.

In Slavonia out of an acreage of 6325 ha. of beet grown for the Osijek sugar factory 1986 ha. were completely destroyed by the *Cleonus*. On one farm near Osijek out of 28.75 ha. 27.6 ha. were destroyed by the 'Wurzelbrand' and Chrysomelids. One farm on which beet was particularly intensively grown lost 34.5 ha. out of about 172.5 ha. although 120,000 'dinars' were spent for the control of the *Cleonus*. Another farm spent 50,000 'dinars' for the protection of its 49.5 ha. of beet and yet had to replough 17.3 ha. which were completely devastated by the *Cleonus*.

These enormous losses of sugar beet caused by insect invasion are due to the whole region being very intensively cultivated but with little variation in the kind of crops grown. The two preceding winters were mild and favoured the development of the insects and were thus a danger for the following years. For this reason the Osijek factory has decided to undertake itself an active control campaign and to continue it the following year on its own account and with a uniform plan. The factory proposes to spray the beet fields immediately after germination. By this means the control instead of being left to the different growers will be under uniform and expert direction.

VARIOUS QUESTIONS

An International Enquiry on the Biological and Artificial Control Measures of Nut Grass (*Cyperus rotundus*) (1).

The spread of the weed known under the botanical name of *Cyperus rotundus* L. (Cyperaceae); the difficulty not merely of destroying it, but also of preventing it

(1) Communication from the official correspondent of the Institute, Dr. R. Cárdenas, Director of the Estación Nacional de Agronomía y Colegio de Agricultura, Moca, República Dominicana.

from invading lands previously not infested ; the very wide area of distribution which is not precisely ascertained but extends from the warm temperate regions to the tropical regions of America, Asia and Africa ; our scanty knowledge of its natural enemies and of any antagonisms there may be between it and other cultivated or wild plants, make necessary an understanding between all engaged in studying the problem of the control of *C. rotundus*.

It would be desirable first to obtain information on the following points :—

(1) Among the countries wherein the presence of this weed has been noted, those in which the plant actually constitutes a problem for the agricultural development of the infested zones ; in other words to ascertain : (a) whether there are countries or zones in which *C. rotundus*, although present, does no damage direct or indirect, or where it is supposed that it does no harm nor in any way hinders agricultural development ; (b) the reason for this.

(2) The animal or vegetable parasites, even of small importance, which may exist in countries where *C. rotundus* is found, with all possible information as to their nature, their ascertained or presumed effectiveness, the possibility of introducing them into countries where they do not exist, etc.

(3) Antagonisms existing between *C. rotundus* and any other plant, wild or cultivated, and in consequence the possibility of using this means of control.

(4) The practices locally adopted for destroying or reducing the infestation or for preventing wholly or partially the spread of this weed in zones previously not affected, including alike practices the value of which has been determined by means of experiments and such as are only empirically employed, with some indication of their ascertained or presumed effectiveness.

(5) The possible artificial control measures, destructive or preventive, which have been tried with more or less success, or even with negative result ; their description, cost of the applications, etc.,

(6) The direct or indirect damage to crops, ascertained or presumed, resulting partially or wholly from the presence of *C. rotundus*, as well as the ascertained or presumed causes of damage which have some relation to the plant in question.

(7) A list of the Governments, scientific institutions, centres of research and individuals interested in the idea of collaboration in an enquiry into *C. rotundus*, and in the means for its control.

All proposals for the further development of this subject whether by enquiry, experiment, organisation, etc., will be welcomed and published as speedily as may be possible in this *Bulletin*.

A series of experiments, instituted in the Dominican Republic, has given the following results :—

(a) A higher evaporation has been ascertained of the lands seriously infested, the increase in evaporation varying from 25 to 75 per cent. as compared with lands not infested by *C. rotundus* ; such evaporation of water was ascertained by a study of the loss of water in Livingstone atmometers and radio-atmometers placed at the level of the growth of *C. rotundus* and on the adjacent non-infested soil, other conditions being equal. Although this explains the impossibility of cultivation of land seriously infested, if situated in zones of scanty precipitation (the semi-arid zones), it does not explain why in zones, where precipitations are abundant, comparative experiments on a reduced scale, using maize and beans, gave from 10 to 25 per cent. less of the product.

(b) The existence of animal or vegetable parasites attacking *C. rotundus* has not been verified.

(c) The effect of cover crops has been variable in relation to the main crop and its duration ; the best results have been obtained with the forage crop *Melinis minutiflora* Beauv., together with reptant and leafy varieties of *Ipomaea Batatas* L., among the cover crops which have a direct production value also.

(d) Semi-permanent coverings, with tarred cardboard, sheets of galvanised iron, etc., of the affected plots are effective but their use is too costly.

(e) As regards chemical substances of which trials have been made, the best results have been secured by strong applications of carbon bisulphide projected into the soil (500 g. per m²) ; this method also is very costly.

(f) An antagonism has been noted between *C. rotundus* and *Ricinus communis*, if the latter is grown in such a way as to shade completely a defined area ; it has been possible to ascertain by means of comparative experiment that this effect is not merely to be ascribed to the fact of shading.

(g) All agricultural work, and more especially ploughing and harrowing, if not carried out with suitable precautions, has a tendency to encourage the spread of *C. rotundus* over the adjacent plots, while these operations have no perceptible effect in diminishing distribution of the weed over any particular area ; in fact the effect is frequently the opposite to that desired.

(h) Diffusion in areas favourable to growth, even if not adjacent, takes place by means of transport of seeds of *C. rotundus* ; the seeds reaching distant points by means of water-ways of all kinds, rivers or canals and even road gutters ; accordingly irrigated lands, and those traversed by rivers, torrents, canals, etc. and lands lying near roads, are infested or liable to infestation more easily than other lands.

LEGISLATIVE AND ADMINISTRATIVE MEASURES

Cyprus. — By Declaration dated 25 February 1931, published as Notification No. 183, the areas declared infested with the 'sirividhi of cereals' (*Syringopais* [*Scythris*] *temperatella*) in the districts of Famagusta and Limassol are delimited. (*The Cyprus Gazette*, Nicosia, 27th February 1931, No. 2115, pp. 106-107).

* * By Order dated 26 February 1931, published as Notification No. 184, the treatment which lands situated within the areas declared infested with *S. temperatella* shall undergo are established and the plants specified which may be grown in such lands. (*Ibid.*, p. 107).

Cuba. — By Presidential Decree No. 560 of 24 April 1931 were approved the internal regulations of the Plant Protection Service ('Servicio de Sanidad Vegetal') under the "Secretaría de Agricultura, Comercio y Trabajo". The regulations, which consist of 58 articles under 17 headings, came into force on 28 April 1931. (*Revista de Agricultura, Comercio y Trabajo*, Órgano Oficial, Habana, Cuba, 1931, año XLII, vol. II, núm. II, págs. 57 a 68).

Egypt. — On 18 July 1931 the Italian Royal Minister of Foreign Affairs informed the International Institute of Agriculture that the International Convention for Plant Protection (Rome, 16 April 1929) [see this *Bulletin*, 1929, pp. 50-51] has been ratified by Egypt on 30 June 1930.

Finland. — On 18 July 1931 the Italian Royal Minister of Foreign Affairs informed the International Institute of Agriculture that the International Convention for Plant Protection (Rome, 16 April 1929) [see this *Bulletin*, 1929, pp. 50-55] has been ratified by Finland on 15 July 1931.

This Convention which has already been ratified by Egypt (see above) and Italy (see this *Bulletin*, 1930, p. 172) will come into force, in conformity with Art. 23, for the three ratifying countries on 15 January 1932.

India (Burma) (1). — By notification No. 9, dated the 7th April 1931, and in exercise of powers conferred by section 5 of the Destructive Insects and Pests Act, 1914, the Government of Burma (Ministry of Forests) makes the following rules for the detention, inspection and destruction of seeds and plants in respect of which a notification has been issued under section 3 or of articles which may have been in contact or proximity thereto and for regulating the powers and duties of Officers appointed in this behalf, when such seeds, plants or articles are imported by air into Burma.

These rules may be called 'The Burma Destructive Insects and Pests Rules, 1931'.

(1) Any person who intends to import any seeds or plants by air shall give notice of such intention to the Collector of Customs, at least 24 hours before the arrival of the air craft conveying the article, and on receipt of the information, the Collector of Customs shall arrange for the deputation of an officer of Customs to inspect the imported article.

(2) The Customs Officer shall have same powers in respect of seeds, plants or other articles, the import of which is prohibited or regulated by notification under section 3, when such seeds, plants or other articles are imported by air, as are conferred upon the officers of Customs by section 4 of the Destructive Insects and Pests Act, 1914, in respect of articles imported by sea.

(3) All seeds and plants imported by air shall be landed at such place as may be appointed by the Government of Burma, by notification and shall be made over to the Customs Officer deputed for their inspection.

(4) Any seeds the import of which by air is prohibited by notification under the Destructive Insects and Pests Act, 1914, and any plant not covered by special certificate of the nature referred to in paragraph 2A of the order published with the notification of the Government of India No. 1541-Agricultural, dated the 23rd July 1930, which is brought into British India by air as part of the cargo or stores of any air craft or as any passenger's luggage or otherwise shall be destroyed by fire under the supervision of the Customs Officer with the least possible delay and in any case within 24 hours of landing.

(5) Imported plants covered by the special certificate mentioned in paragraph 2A of the aforesaid notification of the Government of India, shall be returned by the Customs Officer to the person from whom they have been received under Rule 4 or to any other person authorized duly to receive them.

(6) No compensation shall be payable for articles destroyed under rule 5 of these rules.

(7) Any breach of these rules shall be punishable, on conviction before a Magistrate, with a fine which may extend to Rs. 1,000.

(1) Communication from the official correspondent of the Institute, Mr. U. Thant Su, B. Ag., B. L. C., Mycologist, Burma, Mandalay.

Italy. — By Ministerial Decree of 11 July 1931 regulations have been made for the temporary importation from abroad of varieties of potatoes for use exclusively as seed for the season 1931-1932. Cf. this *Bulletin*, 1930, No. 8, p. 125. (*Gazzetta Ufficiale del Regno d'Italia*, Roma, 16 luglio 1931, anno 72^o, n. 162, pp. 3560-3562).

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NOTES

An International Address Book of Botanists. — It will be remembered that the Fifth International Botanical Congress held at Cambridge, England in 1930 passed a resolution at the final plenary meeting, whereby an International Committee was appointed to arrange for the preparation and publication of a new Address Book of the Botanists of the World. The work of the Committee has now reached an advanced stage and notice has been received at the International Institute of Agriculture that the Address Book will shortly be published for the Bentham Trustees by Messrs. Baillière, Tindall & Cox, 7 & 8 Henrietta Street, Covent Garden, London, W. C. 2.

The Book itself has been planned on lines somewhat similar to Dörfner's 'Botaniker-Adressbuch', and will contain the names of some 13,000 to 14,000 botanists and botanical institutions, etc., in all parts of the world. These will be arranged alphabetically by countries, will be printed in the majority of cases in the language of the country in Roman script and will be provided with an Index of personal entries and Geographical Indices.

It should be noted that, thanks to the assistance given to the Committee by the Bentham Trustees and the Carnegie Corporation of New York, it has been found possible to publish the work at the low price of 12/6 or 13/— post free.

INTERNATIONAL BULLETIN OF PLANT PROTECTION

DISCOVERIES AND CURRENT EVENTS *

Brazil : Principal Insect Pests of Crops (1).

In 1930 a remarkable development of *Ceratitis capitata*, *Anastrepha fratercula* and *Lonchaea pendula* was observed on fruit trees at the Fruit-Growing Station of Deodoro ; the requisite control measures were adopted.

Among the insect pests of sugar cane *Tomaspis liturata* has not developed as in the period from 1920 to 1924, when it caused serious alarm. The instructions of the ' Instituto Biologico de Defesa Agricola ' contained in Bulletin No. 4 of the writer provide planters with the information on the biology of the parasite necessary to control it successfully. *Diatraea saccharalis* infests old plantations ; with the replanting of these the insect disappears. *Pseudococcus bromeliae*, *Ps. calceolariae*, *Ps. boninsis* and *Ps. citri*, which occur on the base of the leaf sheath, were eliminated by means of cleaning the canes intended for sugar extraction, and in the case of canes for propagation purposes by means of disinfection with carbon bisulphide.

Icerya purchasi was more numerous in 1930 than in the preceding year ; at Nova Iguassú and Rio de Janeiro some colonies of *Novius cardinalis* were liberated, which were received from the ' Secretaria de Agricultura ' of São Paulo. In 1930 the Crop Protection Inspector, Paulo Werner, obtained at Rio de Janeiro some stems of chrysanthemum infested with *I. purchasi* and bearing also numerous specimens of the predator, which after a few days in the insectarium of the Entomological Service had eliminated all the scale insects.

Aspidiotus perniciosus remains confined to one part of the State of Rio Grande do Sul, in the municipality of Rio Negro. In the State of Paraná there would have been a revival in the local breeding ground of the pest but active control measures were adopted in time.

Eriosoma lanigerum, one of the most injurious of the aphides, did not assume serious proportions, which was undoubtedly due to the action of its parasite, *Aphelinus mali*, now widely distributed.

Margarodes brasiliensis infests the roots of vines in the State of Rio Grande do Sul ; if the systematic disinfection of the soil with carbon bisulphide is persisted in the pest will not develop seriously.

Perilymbia vastatrix is confined to a small vine-growing zone in the State of Rio

* In this, as in the next chapter, the countries are arranged in French alphabetical order.

(1) Communication from the official correspondent of the Institute, Dr. Carlos MOREIRA, Director of the Instituto Biologico de Defesa Agricola, Rio de Janeiro.

Grande do Sul ; forbidding the export from the zone of stems and other parts of the plant has contributed to the limitation of infection

Schistocerca paranensis, which has caused great losses in the plantations of Argentina and Uruguay, has not invaded frequently the State of Rio Grande do Sul.

Platyedra gossypiella, which did much damage to the cotton plantations on its appearance in Brazil, is now causing little loss. The control of *Gasterocercodes gossypii* is being actively conducted by the 'Serviço de Algodão'.

Costa Rica : The ' Enfermedad del Café ' (1).

A pathological phenomenon has recently been observed in the coffee plantations of Costa Rica which has caused serious alarm among the growers and all who realise the harm which may be caused to the economy of the Republic by a reduction in the crop of the principal export product.

The ' Centro Nacional de Agricultura ' has already determined with certainty the causes of the phenomenon and is able to state that it results from a serious attack, principally of young plants, by three different insects : — *Saissetia hemisphaerica*, *Pseudococcus* sp. and an *Aphis*.

The first two insects do damage mainly in the dry season by sucking the juices of the plant and killing the tissues, which appear charred. The insects multiply rapidly in the dry season and disappear almost completely at the beginning of the rains. It is not possible to observe the cause and effect together on one and the same plant because the insect feeds at the expense of the living tissues and as soon as they begin to wither passes on to another healthy plant. The two insects cause the partial or total death of the new shoots which results in the defoliation of the part attacked. The withering of the tissues ceases as soon as the cause is removed.

The *Aphis* attacks principally both surfaces of the tender leaves and terminal bud causing, just as the other two insects, the death of the plant and the charring of the tissues.

The *Aphis* cannot be found on the dead parts because, as with the other insects, it requires for its sustenance the juices of living tissue. In this case also the withering of the tissues ceases with the action of the insect.

The *Aphis* is more resistant to wet and so can continue its damage during the rainy season. For this reason the *aphis* injury is the only one of importance to the coffee plantations and whose symptoms correspond to those commonly called ' enfermedad del café '.

The fully grown plantations which show most the effects of *Aphis* attack are those which as a result of the cultivation methods used, the type of shade, the position or the quality of the soil or subsoil are completely defoliated during the dry season. The formation of new leaves is made impossible by the *Aphis* which attacks them as soon as they appear. The effects of the *aphis* are in inverse ratio with the degree of foliation of the plant.

The reduced crop from the most seriously damaged plantations does not depend so much on the action of the insects as on the loss of foliage resulting from drought.

If the plant is badly injured at the same time by both drought and the insects it loses its leaves completely and not being able to sustain its own tissues as well

(1) Communication from the official correspondent of the Institute, Mr. Bernardo R. YGLESIAS, Director of the Centro Nacional de Agricultura, San Pedro Montes de Oca (Republic of Costa Rica).

as the insects from lack of the organic matter formed only in the leaves and green stems, it cannot renew its growth and dies. Withering from lack of nutrition begins in the roots because this is the part of the plant furthest removed from the leaves. Only after death has set in in the leaf tissues does the action of bacteria and saprophytic fungi begin, for these do not cause decomposition.

The 'Centro Nacional de Agricultura' makes the following recommendations to coffee planters who have had their plantations injured —

(1) where branches and young shoots have been killed during the dry season by *Saissetia* and *Pseudococcus* it is necessary to cut back to just above the first healthy bud in order to renew the upper part of the plant with new shoots ;

(2) if the shoot still has one or two healthy internodes the shoot must be cut back so that a secondary branch will take the place of the first ;

(3) if the plant has been completely defoliated it can recover only very slowly by the production of new suckers. The reaction of the plant in this condition will never be more than mediocre so that it is better to remove it and substitute a healthy and vigorous plant ;

(4) where the young leaves and terminal bud are attacked by *Aphis* the latter can be destroyed by the application of contact insecticides. The most effective insecticide against *aphis* is a compound of sulphate of nicotine called commercially 'Black Leaf 40', but this preparation is not at present obtainable in Costa Rica. Recourse must therefore be taken to an emulsion of rosin spirit which can easily be prepared from ingredients which are found abundantly in the country.

The emulsion is prepared by dissolving $\frac{1}{2}$ lb. of whale oil soap or 1 lb. of yellow soap in 4 litres of boiling water. To this are added 8 litres of rosin spirit and the mixture is emulsified by passing it twice through the syringe or until the liquid appears milky and has no free rosin spirit on the surface. This emulsion may be diluted in 12 parts of water when the insecticide will contain about 4.5 % of rosin spirit. To make the emulsion combine well with the water it must be stirred vigorously. It must be borne in mind that if the rosin spirit is not completely emulsified it may injure the young parts of the plant.

For the insecticide to produce the desired effect it is essential that the insects should be properly wetted, otherwise no force will be of avail. The spraying of plants on which the insects have not been observed is also useless.

The efficacy of the insecticide depends also on the form in which it is applied. The best results are obtained with a very fine spray such as is obtained with the sprayers specially designed for the purpose. For large plantations it is necessary to have large motor-worked spraying machines which make it possible to do the work adequately and economically. When only a small number of plants is injured good results may be obtained by hand spraying.

If the *Aphides* are located on the under surface of the leaves spraying must be done from below to ensure their being reached by the insecticide.

Cirenaica : Insect Pests (1).

Doclostaurus maroccanus Thnb. — A campaign against swarms of hoppers of Moroccan locust was carried on in the neighbourhood of El Abiar in the region of Barce from March 16-27 and from March 28 throughout April.

(1) Communication from the official correspondent of the Institute, Mr. G. KRÜGER, Director of the Entomological Laboratory of the 'R. Ufficio per i Servizi Agrari' of Cirenaica, Bengasi.

Each swarm was sprayed during the moulting stage with a mixture of 'Urania', sodium arsenite and common salt, and the result was deadly, almost instantaneous, in every case.

The abundant herbaceous vegetation of the uplands of Cirenaica make the use of poisoned bran impossible, although the arsenical mixtures at 0.8-1 % applied during the moult left nothing to be desired.

In Cirenaica *D. maroccanus* is a remnant and, considering an invasion of the region impossible with the present geographical distribution of the species, the Government has made provision for the complete destruction of the pest by forming a vast network of deposits of poison and implements.

The Government has also issued strict regulations for the reporting of breeding grounds of the Moroccan locust, also of breeding centres and alighted swarms of the Desert Locust (*Schistocerca gregaria*) in oases in the sandy and marshy regions.

Megachile sericans Fourc. (*Apidae*, *Gastrilegidae*). — After the control carried out in 1929 in the vicinity of the Experiment Station of La Zorda (Barce) by poisoning of the foliage of the vines and of the flowers of *Thymus* the species appeared again this year in scanty numbers.

Opatrioides punctulatus Rtrr. — This beetle, which has been previously reported (cf. this *Bulletin*, 1930, No. 10, p. 146 and 1931, No. 1, p. 5), is a pest in the neighbourhood of Barce to the tomato plantations, gnawing the peduncles of the fruit.

Poisoned bran, which is the most effective means of controlling *Tenebrionidae*, was spread in the plantations free from weeds.

Egypt: Occurrence and Movements of Locusts (*Schistocerca gregaria*) (1).

The red swarms, reported late in May 1931 from Sinai, the Eastern Desert Kena and Assuan Provinces, were reinforced by others coming from the East and South East. During the first week of June 1931, the situation looked somewhat serious on the Red Sea littoral between Hurgada and Koseir.

The general line of migration was towards the South and South West. In a few cases, however, the locusts influenced by the prevailing winds went to the North and the North West.

Some of the invaders reached the Nile Valley at Girga, Kena and Assuan and were recorded as far west as Kharga Oasis.

After June 11th. no fresh arrivals were reported until the 24th. when a swarm about 200 × 50 metres appeared at El Derr coming from the East. They settled only for a while and then returned to the East.

The two fighting parties working on the Red Sea littoral destroyed a big percentage of the fliers. Scouting the desert region between the Red Sea and the Nile has been going on all the time.

In a few cases the locusts settled for a short time on cultivated crops and trees but were soon either destroyed or driven away.

A thorough inspection of all cultivated localities visited by the locusts showed that they had inflicted but very little damage.

At present there are no locusts in the country and we do not expect any more at least for this season.

(1) Communication from the official correspondent of the Institute, Mr. E. BALLARD, Chief Plant Pathologist, Plant Protection Section, Ministry of Agriculture, Cairo, Egypt.

United States of America: Outstanding Entomological Features (1).

The following notes refer to June, 1931.

The severe armyworm (*Cirphis unipuncta* Haw.) outbreak reported from Texas as far northeastward as Virginia in May became serious during the month of June in the East Central States westward to Iowa. In the East Central States this insect is doing considerable damage to small grain and corn.

The unusual cutworm prevalence that developed during May progressed through the early part of June, reports of serious damage to a great variety of crops having been received from Connecticut southward to Virginia and westward to Colorado and Utah. The most serious phase of this cutworm development is an outbreak of the variegated cutworm (*Lycophotia saucia* Hbn.) which extends from southern Nebraska across Kansas and into Oklahoma and Arkansas.

During June grasshoppers developed to such an extent as to require control measures in northwestern Minnesota, throughout the two Dakotas, southward through Nebraska to north central Texas, and westward into the Great Basin region. There is a local outbreak in Klamath and Lake Counties, Oregon, where 25,000 pounds of poisoned bran mash are being distributed daily for their control.

Wireworms have been reported as doing rather severe damage to corn in Vermont and Pennsylvania and to a variety of crops from New York southward to Maryland and westward to Iowa and Nebraska. The wireworm *Heteroderes laurentii* Guer. more seriously damaged the commercial Irish potato crop of Alabama than it has in any year since its discovery in that State.

The Hessian fly (*Phytophaga destructor* Say) is apparently decidedly on the increase in the East Central States, with scattered serious infestations in Nebraska and Kansas. Rather heavy infestations of spring wheat by this insect are reported from the Willamette Valley of Oregon.

A rather unusual infestation of wheat by the tenebrionid *Blapstinus gregalis* Casey in the region north of Great Falls in Montana occurred during the month. In the infested fields as many as 100 beetles to the square yard have been observed.

During the last week in June recently hatched nymphs of the chinch bug (*Blissus leucopterus* Say) were observed in the heavily infested area extending from western Ohio to southeastern Kansas. The outbreak this year seems to be more severe than has been recorded for several years.

The corn ear worm (*Heliothis obsoleta* Fab.) became seriously destructive in the Gulf region and the lower Mississippi Valley during the early part of the month and was first observed in Nebraska about June 10 and in Maryland June 15.

More damage has been occasioned to corn by sod webworms (*Crambus* spp.) in the East Central States than has occurred in a number of years, very serious damage being reported from Ohio westward to Iowa.

The velvetbean caterpillar (*Anticarsia gemmatilis* Hbn.) appeared in the Everglades of Florida on June 10. This is about two weeks earlier than in 1930.

During the early part of June the rosy apple aphid (*Anuraphis roseus* Bak.) developed to serious proportions in southern New England, and in the Middle Atlantic and East Central States extending southward to Arkansas. Very heavy infestations by this insect are also reported from the Pacific Northwest.

First side-worm injury by the codling moth (*Carpocapsa pomonella* L.) was

(1) Communication from the official correspondent of the Institute, Mr. J. A. HYSLOP, Senior Entomologist in Charge, Insect Pest Survey, transmitted by the Acting Chief, Bureau of Entomology, United States Department of Agriculture, Washington, D. C.

reported from Massachusetts about June 16. By the middle of the month eggs were hatching in the Hudson River Valley of New York and by the third week of the month they were hatching in numbers in western New York. Side-worm injury had started in southern New Jersey by June 9. From the Hudson River Valley southward to Georgia the codling moth seems to be unusually abundant. Very heavy infestations are also reported from the greater part of the East Central States westward to Nebraska and Kansas. In the Pacific Northwest the codling moth situation is more serious than it has been for several years.

Apple leafhoppers are doing considerable damage in the Northeastern and Middle Atlantic States southward to North Carolina.

The oriental fruit moth (*Laspeyresia molesta* Busck) situation on the whole seems to be much less serious than at this time last year.

Although the light infestation of the plum curculio (*Conotrachelus nenuphar* Hbst.) reported in May prevailed over the South Atlantic States infestation by this insect developed to rather serious proportions in the Hudson River Valley and Connecticut. The first beetle of this year's generation to be observed in a pupal cell was seen at Fort Valley, Ga., on June 1. The first transformation reported last year was on May 23, which itself was considered late.

Considerable damage was done in southern Georgia to pecans by the pecan leaf case bearer (*Acrobasis juglandis* LeB.) while in Florida the nut case bearer (*Acrobasis caryae* Gr.) destroyed over 75 per cent of the crop about Jacksonville. In the vicinity of Albany, Ga., the nut case bearer infestation is extremely light.

The hickory shuck worm (*Laspeyresia caryana* Fitch) on pecan is occasioning considerable alarm in parts of Georgia and Mississippi.

The Mexican fruit worm (*Anastrepha ludens* Loew) was found infesting locally grown fruit at Matamoros, Mexico, and in a grove near Mission, Texas.

The seed corn maggot (*Hylemyia cilicrura* Rond.) was rather destructive in New York and the East Central States southward to Kentucky and westward to Nebraska.

The cabbage maggot (*Hylemyia brassicae* Bouché) is occurring in outbreak numbers in Connecticut, New York, and New Jersey, with serious damage also reported from Indiana, Kentucky, and Wisconsin. In Connecticut one grower estimated his loss at between 2,000 and 3,000 plants while plants in unscreened beds in New York State were damaged from 15 to 60 per cent.

The Colorado potato beetle (*Leptinotarsa decemlineata* Say) continued to be unusually abundant in the Middle Atlantic States westward to Illinois, and an unusual outbreak of this insect was reported from northwestern Iowa.

The potato aphid (*Illinoia solanifolii* Ashm.) is much more abundant on potatoes and tomatoes on the eastern shore of Maryland and Virginia than usual. This insect is also reported as being very abundant in Indiana and Ohio.

The Mexican bean beetle (*Epilachna corrupta* Muls.) is causing serious damage in Hartford County, Conn., and became so numerous in parts of New Jersey that the supply of insecticides for their control was exhausted.

The asparagus beetle (*Crioceris asparagi* L.) was very troublesome from Connecticut westward to Iowa, complete devastation taking place at many points. This insect is also becoming a serious pest in Colorado and California.

Throughout practically the entire country, from New England to Florida and westward to Iowa and Nebraska, the striped cucumber beetle (*Diabrotica vittata* Fab.) is being reported as unusually destructive.

From central Ohio westward to Wisconsin the pea aphid (*Illinoia pisi* Kalt.) is so abundant that the pea crop is seriously threatened.

The potato tuber worm (*Phthorimaea operculella* Zell.) was found attacking tobacco at several places in Kentucky during the third week in June. This is said to be first record of the occurrence of this insect in that State.

A very heavy emergence of Brood V of the periodical cicada (*Tibicina septendecim* L.) is reported from the upper end of Long Island. The occurrence of Brood V in New York State was first definitely established by W. T. Davis in 1914, although there are a few old records of this brood's appearing there in 1897.

Canker worms (Geometridae) have defoliated large areas of forest lands in the Red River Valley of North Dakota and are much more numerous than usual in parts of Minnesota, Iowa, Nebraska, and Kansas.

The elm leaf beetle (*Galerucella xanthomelaena* Schrank) is prevalent in southern New England and is appearing in large numbers in Rhode Island.

India: A New Virus Disease of *Dolichos biflorus* (1).

A new virus disease of *Dolichos biflorus* L. was observed in 1930 in a plot on the College Farm, Poona. Most of the vines were badly affected, although there was considerable vegetative growth. The disease is said to be very serious and is generally prevalent in the Bombay Presidency. It has also been observed causing severe damage to *Dolichos lablab* L. in Gujarat.

In general appearance the disease resembles the mosaic disease of the bean, *Phaseolus vulgaris* L. The leaves show chlorosis, clearing of the veins, blistering and downward cupping of the lamina. Our observations indicate that the seedlings develop these symptoms on the pinnately trifoliate leaves, while the first two oppositely placed leaves are always normal in appearance. The leaves dry towards the end of the season. There is considerable shedding of flowers in the plants affected with mosaic, and consequently the yield is much reduced. The setting of pods is very defective, and a large number of them remain sterile. The affected plants are rarely killed but continue to vegetate.

No attempts have yet been made to effect transmission of the disease by the inoculation of leaves with juice expressed from mosaic-affected plants. However, in tests made in 1930 it has been ascertained that the mosaic virus can be transmitted through the seed of *Dolichos biflorus* L. In these tests as high as 25 to 40 per cent of seed infection was found in different seed lots purchased from the market.

India: *Rhizoctonia bataticola* on Sorghum in the Bombay Presidency (2).

In the past winter season sorghum crop was extensively damaged in East Decan. In many places damage to the crop was very serious reducing it to a 4-anna crop. *Rhizoctonia bataticola* has been isolated from the affected plants. This disease is also serious near Broach, Gujarat and is called there by the local name of 'Kharkharia'. It is suspected that tobacco and cotton also suffer from this disease in Gujarat.

(1) Communication from the official correspondant, of the Institute, Dr. B. N. UPPAL, Plant Pathologist to Government, Bombay Presidency, Poona.

(2) Communication from the official correspondent of the Institute, Dr. B. N. UPPAL, Plant Pathologist to Government, Bombay Presidency, Poona.

Palestine: Insect Pests (1).

During the years 1929 and 1930 the survey of almond producing areas, carried out to determine, inter alia, the percentage of trees severely damaged by *Capnodis carbonaria*, Klug. (Buprestidae), resulted in 9,265 trees being uprooted as non-productive owing to the attacks of this pest, and during the season of emergence of the adult beetles, 39,347 of these insects were collected by hand and destroyed. The work proceeds during 1931.

The beetle pest of apricots known as *Cerambyx dux* Fald. (Cerambycidae) has been investigated in considerable detail and an adequate control method advised.

The life histories and control of the two grape pests known as the Bud and Leaf Moth, *Theresia ampelophaga*, Bayle and the Grape Berry Moth, *Polychrosis botrana*, Schiff., have been studied locally.

The harmful fig pest known as *Ceroplastes rusci*, L. (Coccidae), has been controlled successfully by fumigation with hydrocyanic-acid gas. The operation is performed during the autumn months after removal of the crop. Costs of transport of fumigation material, owing to the isolated position of some fig-producing areas in the hills, is high.

A scientific system of checking the results of fumigation of citrus against the locally-termed Black Scale (*Chrysomphalus aonidum*, L.) has been instituted. This system embodies exact instructions for the taking of samples of leaves and fruit from fumigated trees; the percentage of trees to be examined in a fumigated grove; and treatment of such samples for checking purposes. Samples are taken 10 days after fumigation. Examination of scale from fumigated trees is performed by binocular microscopes.

Since the inception of fumigation of citrus on a scientific basis in 1928, 233,000 trees have been treated. The work has been performed by the Government. It is proposed to hand the work over in the future to private firms, under contract, as it has expanded very considerably.

In Northern Palestine, where Black Scale is widely spread and is a major pest of citrus, all extensive plantings of this crop have been photographed aerially and from these maps plans have been completed which indicate, with exactness, location of individual groves, number of trees therein and owner's name. This will simplify, enormously, future operations in such areas.

The locust campaigns of 1928, 1929 and 1930 have shown that in Palestine the principal and most economic means of locust control are as follows:— For control of flying locusts flame-guns give superior results if utilized during the early morning hours when the insects are torpid. For the eggs double ploughing is well worth while in suitable soil and when supplies of animals and implements are easily procurable. For the young locusts poison bait (Sudan formula but not previously dried) combined with the use of zinc sheets barriers.

Palestine is not a large country but it has a dense rural population in most areas and means of communication and transport are excellent. These factors simplify to no mean extent the successful prosecution of a locust campaign.

(1) Communication from the official correspondent of the Institute, Mr. E. R. SAWER, M. A., B. Sc., Director of Agriculture and Forestry, Jerusalem, Palestine.

Southern Rhodesia : *Alternaria* Leaf Spot of Tobacco (1).

During the past season, a serious leaf spotting of tobacco occurred in several districts doing very considerable damage to individual crops. Only two previous records of the disease have been received, but it is probable that scattered outbreaks may have occurred and not been reported.

The chief symptom is the appearance of small brown spots upon the lower leaves at the time when the plants are just coming into flower. The spots enlarge up to a diameter of as much as 2 cm., the modal diameter being about 1 cm. They are chestnut or vandyk brown in colour, depending on the variety of tobacco, and frequently shew a light brown, or even white, area in the centre, when the disease strongly resembles Frog Eye (*Cercospora nicotianae*) from which it is difficult to distinguish without the aid of a microscope. Sometimes, but not always, zonations are present in the darker brown parts of the lesions. Dark spots upon stem and midribs and the rapid spread of the disease to the uppermost leaves and seed pods are characteristic of *Alternaria* leaf spot.

The cause of the disease has been shown to be due to an *Alternaria* which has been referred to *A. tabacina* Ell. and Ev. (Hori), but the fungus does not appear to be the same as *Macrosporium tabacinum* Ell. and Ev. reported from white speck of tobacco.

It is probably identical with the organism causing a similar leaf spot, recorded by Gulyás (Kísérletügyi Közlemények, xxxiii, 2, 1930) in Hungary.

Serious loss in quality of leaf is also attributed to the disease which apparently extends the area of infection during the process of curing.

Varieties affected include Hickory Pryor (severely), Orinoco White Stem, Gold Leaf, Warne and a Turkish variety.

Conditions favouring the disease are continued and heavy rain followed by bright periods, which induce rapid growth in the plant.

'Priming' off infected leaves has not proved successful as a control measure. Investigations are proceeding.

LEGISLATIVE AND ADMINISTRATIVE MEASURES

Germany (2). — By Decree No. 10 of 25 June 1931 the Decree of 27 September 1928 concerning the importation of barley coming from the United States of America (see this *Bulletin*, 1929, No. 7, p. 101) will remain in force until 31 December 1931.

Australia (Queensland). — By an Order dated 14 May 1931 the Government of Queensland has authorised the Committee of Direction of Fruit Marketing to offer a prize of £ 1000 to any person who shall discover an effective method of con-

(1) Communication from the official correspondent of the Institute, Mr. J. C. HOPKINS, B. Sc. (London), A. I. C. T. A. (Trinidad), Plant Pathologist, Department of Agriculture, Salisbury, Southern Rhodesia.

(2) Communication from the Biologische Reichsanstalt für Land- und Forstwirtschaft, Berlin Dahlem, official correspondent of the Institute.

trolling banana thrips (*Scirtothrips signipennis* Bagnall) and has fixed the regulations for the competition. (*Queensland Government Gazette*, Brisbane, 16th May, 1931, Vol. CXXXVI, No. 152, p. 2064).

Cyprus. — By Order in Council No. 1421 of 23 April 1931 regulations have been provided for the importation into the island of plants and plant parts, whether fresh, dried or preserved, also of other plant products, soil, mould, sand, fertilisers, etc. The Order contains models of the certificates of inspection and fumigation required to be issued by the competent authorities of the country of origin. (*The Cyprus Gazette*, Nicosia, 1st May, 1931, No. 2131, pp. 323-325).

Italy. — By Royal Decree-Law No. 799 of 12 June 1931 a reduction of the normal trade tax on fertiliser and anti-parasitic materials directly utilisable in agriculture is provided. The anti-parasitic materials include copper sulphate, 'Caffaro' powder and paste and refined sulphur. (*Gazzetta Ufficiale del Regno d'Italia*, Roma, 1^o luglio 1931, anno 72^o, n. 149, p. 3248).

* * The Law No. 987 of 18 June 1931, contains enactments relating to the protection of cultivated plants and agricultural products against diseases and pests and to the services relating thereto. The Law No. 94 of 3 January 1929 with the same title (cf. this *Bulletin*, 1929, pp. 22-28) is therefore abrogated, with the exception of Art. 19.

Arts. 1-9 of the new Law concern the inspection of nurseries, of seed selection establishments and of the exportation of plants, plant parts and seeds. Art. 1 enacts *inter alia* that plant nurseries whose products are intended even in part for foreign export must possess, in addition to the requirements of the old Law, those of the International Conventions in force.

With a few modifications, many only in form, Arts. 2, 3, 4 and 5 of the old Law have been inserted in the new. The following addition has been made to Art. 5 : — Producers, nurserymen and tradesmen who have obtained from the Prefect of their Province the prescribed authorisation for their business may sell their produce or merchandise also in the public markets, either directly or through the agency of a third party, and in conformity with the rules of guarantee which shall be fixed by the regulations for the application of the new Law.

Arts. 6, 7, 8 and 9 of the old Law have also been preserved with slight remodelling.

Arts. 10-14 of the Law now in force concern the works and 'Consorti' for crop protection which were dealt with in Arts. 10, 11, 12, 14 and 16 (in part) of the old Law.

Arts. 18-20 of the new Law deal, mainly from an administrative point of view, with the 'Consorti' for the improvement and increase of crops (Consorti per la Viticoltura, 'Consorti per l'Olivicoltura', etc.).

Arts. 21-35 of the new Law contain the general provisions (Commission for plant protection; institutions and bodies formed on the disbanding of the Plant Protection Services; administration, technical direction, etc. of the 'Consorti' for crop protection; penalties for offences, etc.) which were the subject of Arts. 15, 16 (in part), 17, 18, 20-24 and 26 of the old Law. (*Gazzetta Ufficiale del Regno d'Italia*, Roma, 24 agosto 1931, anno 72^o, n. 194, pp. 4190-4195).

* * By Ministerial Decrees of 31 July 1931 the Communes of Niella Tanaro, Mombasiglio (province of Cuneo) and Sicignano degli Alburni (province of

Salerno) have been declared infected with grape phylloxera. (*Gazzetta Ufficiale del Regno d'Italia*, Roma, 8 agosto 1931, anno 72^o, n. 182, p. 4012).

*** In consequence of the United States Department of Agriculture having allowed to remain in force again during the current season of export of Italian chestnuts the provisions established by Order H. B. 215 of 14 June 1928 and the regulations fixed by the Department for the seasons 1929-30 and 1930-31, the Italian Ministry of Agriculture and Forests has decided to sanction for the current year the temporary regulations fixed in Circular No. 77 of 1 September 1930 (cf. this *Bulletin*, 1930, p. 172) (1).

Morocco (French Zone). — By Vizirial Decree of 10 June 1931 (23 moharrem 1350) whoever sells insecticides or fungicides, whether raw material or compounds, must state for the information of the purchaser at the time of sale or delivery, on a delivery note or on the detailed invoice, the precise name and composition of the products placed on sale, indicating the useful components and their per cent. proportion, and in addition all the indications necessary for the identification of the products.

The same indications must be given clearly on the wrappings and containers in which the goods are consigned to the purchaser, on the wrappings and containers in which the goods are placed prior to delivery, as well as on the prospectuses, instructions, advertisements, posters, price lists and trade documents. (*Empire Chérifien. Protectorat de la République Française au Maroc. Bulletin Officiel*, Rabat, 3 juillet 1931, XX^e année, n^o 975, p. 788-789).

*** By Decree of the Director General of Agriculture, Trade and of Land Settlement of 12 June 1931, all sellers of sulphur must show on the delivery note or on the invoice, on the wrappings, containers or packing material, and on the advertisements, bills or price lists, the degree of fineness and the form under which it is sold (rock sulphur, flowers of sulphur, ground sulphur, etc.), as well as the indication of pure sulphur content. (*Ibid.*, p. 789).

*** By Decree of the Director General of Agriculture, Trade and Land Settlement of 12 June 1931, all sellers of copper salts or other copper compounds or preparations with a copper basis, must show on the delivery note or invoice, on the wrappings, containers, or packing material, and on the advertisements, bills or price lists, the content in copper of the product sold.

For copper compounds intended to be utilised in the form of powder, it is necessary also to indicate the degree of fineness. (*Ibid.*, p. 789).

*** By Decree of the Director General of Agriculture, Trade and Land Settlement of 12 June, 1931, all sellers of arsenical products or of preparations containing such products, must show on the delivery note or the invoice, on the wrappings, containers or packing materials, and on the advertisements, bills, or price lists, their nature (arsenite of soda, arsenate of lime, etc.), their content in arsenic and the form in which the arsenic is present, either soluble or insoluble.

For insoluble arsenical compounds, the proportion of soluble arsenical compounds blended must also be shown. (*Ibid.*, p. 789).

(1) Communication from the Ministry of Agriculture and Forests to the International Institute of Agriculture.

* * A Vizirial Decree of 26 June 1931 (9 safar 1350) establishes special and exceptional gratifications for the technical staff of the external services of the General Department of Agriculture, Trade and Land Settlement, who are engaged in the locust control campaign. (*Ibid.*, p. 791).

Rhodesia. — The Government Notice No. 192 published on the 17 April 1931 prohibits the importation into Southern Rhodesia from any place overseas of unmanufactured broom corn derived from sorghum, whether green or dry, except under the authority of a special permit from the Minister of Agriculture and Lands, or his authorised substitute, the issue of which is subject to the condition that the straws must be detached, and the crowns from which they originate must be completely cut away or otherwise cut to shreds. (*The Rhodesia Agricultural Journal*, Issued by Authority of the Minister of Agriculture and Lands, Salisbury, Rhodesia, 1931, Vol. XXVIII, No. 5, p. 500).

Tripolitania. — By Governatorial Decree No. 4678 of 3 June 1931 the regulations governing the exportation of potatoes and tomatoes are established. The regulations require *inter alia* that produce for export shall be free from parasitic injury and other defects. (*Bollettino Ufficiale del Governo della Tripolitania*, Tripoli, 16 giugno 1931, anno XVIII, n. 13, pp. 760-765).

Tunis (Regency of). — By Decree of 31 December 1930, published on 10 January 1931, the boundaries of the zone of protection round the vineyard of Saint-Joseph de Thibar, which was declared infected with grape phylloxera, have been modified. It is prohibited to plant new vines within the protection zone. This restriction will cease at the expiration of five years from the year when grape phylloxera shall have totally disappeared from the vineyard of Saint-Joseph de Thibar and from any vineyards situated within the zone of protection which may have become infected. (Régence de Tunis-Protectorat Français. Direction Générale de l'Agriculture, du Commerce et de la Colonisation. *Bulletin*, Tunis, 1930 [sic], XXXV^e année, 1^{er} trimestre 1931, n° 144, p. 1-2).

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NOTES

International² Diplomatic Conference for the Protection of Birds Useful to Agriculture. — The Conference (see this *Bulletin*, 1931, No. 4, p. 57) which was arranged for 5 October 1931 at the Hague has been postponed to a later day at the instigation of the Government of the Netherlands.

Vth International Entomological Congress. — The Congress will be held in Paris in July 1932 under the Presidency of Professor P. Marchal, Director of the Central Entomological Station of Paris. There will be Sections devoted to Agricultural Entomology and to Forest Entomology.

INTERNATIONAL BULLETIN

OF PLANT PROTECTION

DISCOVERIES AND CURRENT EVENTS *

Algeria: Control of Mole-Crickets (1).

The mole-cricket (*Gryllotalpa vulgaris*) may be regarded as the most serious pest of market gardens in Algeria. Almost the only control method used hitherto has been the application of carbon bisulphide on the bare ground a month before planting; but the cost of this treatment allows of its use only in certain cases.

Recent experiments carried out at Constantine, Fort de l'Eau, Ain Taya and Oran have shown the high value of bait poisoned with zinc phosphide, which was recommended in Italy by Prof. E. Malenotti, Director of the Phytopathological Observatory in Verona.

The bait is composed of powdered maize (100 parts), water (26 parts) and zinc phosphide (5 parts) and has given entirely satisfactory results.

By spreading the bait in the evening at a rate of about 50 kilos to the hectare between the rows, on ground which has been previously watered, and immediately covering it over, complete and rapid destruction of the mole crickets was effected without any damage to the plants.

This method of control should speedily enter into common practice in Algeria because in addition to its efficacy, it has the advantage of being really inexpensive, costing about 160 francs per hectare.

Cyprus: Downy Mildew of the Vine (*Plasmopara viticola*) (2).

A severe outbreak of this disease has occurred in 1931, probably due in a large measure to the unusually damp weather experienced during May and the early part of June.

This disease occurs to a small extent in some years but it is unusual for so severe an outbreak to occur and consequently vine growers are not in the habit of spraying vines, which has contributed to the spread of the disease this season.

Cyprus: Locust Campaign, 1930 and 1931 (3).

The first hatchings of Moroccan locusts (*Locustotaurus maroccanus*, Thnb.) were reported on March 13th, 1930 eight days earlier than the previous year.

The campaign was again carried out largely by the purchase of locusts collected

* In this, as in the next chapter, the countries are arranged in French alphabetical order.

(1) Communication from the official correspondent of the Institute, Mr. DELASSUS, Crop Protection Inspector, Government General of Algeria, Algiers.

(2) Communication from the official correspondent of the Institute, Mr. H. M. MORRIS, M. Sc., F. E. S., Government Entomologist, Nicosia, Cyprus.

(3) Communication from the official correspondent of the Institute, Mr. H. M. MORRIS, M. Sc., F. E. S., Government Entomologist, Nicosia, Cyprus.

in hand nets, a total of 57,938 okes (nearly 72 ½ tons) being destroyed by this means. In addition poisoned bran bait was used over a number of areas, a total of about 62 tons of bran being used.

Moroccan locusts appeared to be rather more numerous than in the previous year and occurred in some outlying areas where their occurrence had not been recorded previously, or not for some years. The use of bran bait was found most convenient in such areas.

Calliptamus italicus, L. also occurred abundantly in some areas and were dealt with by the same methods and are included in the above figures.

Tettigonia viridissima, L., *Decticus albifrons*, Serv. and other large Tettigonids were also accepted for purchase, at a lower price than the locusts owing to their larger size, and 11,278 okes (rather over 14 tons) were destroyed by this means. When present in large numbers these Tettigonids cause serious damage to crops.

* * *

First reports of hatching were received in 1931 about the same date (March 13th) as in 1930. The campaign was carried out on similar lines to that of the previous year.

The occurrence of Moroccan locusts (*Dociostaurus maroccanus*, Thnb.) was considerably less than in the previous year, only 29,815 okes (37 ¼ tons) being brought in for purchase. This decrease may be due to the occurrence of a short period of wet and relatively cold weather at the end of March, it being unusual for such weather to occur after the hatching. Bran bait was again used in several areas.

Calliptamus italicus, L. which hatches about a month later than *Dociostaurus*, was about as abundant as in the previous year, while the Tettigonids were less abundant and only 2067 okes (over 2 ½ tons) were purchased and destroyed.

Eritrea: Desert Locusts (*Schistocerca gregaria*) (1).

The flights reported in April 1931, coming from the Abyssinian frontiers, made their way in May to the Eastern low plateau where they became merged with the locusts hatched there and escaped destruction. The combined flights then crossed the valleys of the eastern slope leading to the high plateau.

Between the 9 and 10 May, numerous flights, partly consisting of young locusts and partly of individuals which had reached sexual maturity, were reported at Decamerè, in Hamasien, in the territory of the Mensa and in the Gundet (Seraè).

On 12 May, a flight, coming from Degghen, flew over the Hazamò, making its way over the frontier.

On 15 and 16 May, two flights were observed also on the western low plateau, one on the territory of Biscia and the other at Barentù, both coming from Abyssinia and making their way towards Adi Ugri.

On 24 May, a few locusts, coming from the east, flew over Elabered, making their way to Cheren.

On 26 May, locusts coming from the high plateau made their way towards the high Barca.

(1) Communication from the official correspondent of the Institute, Dr. A. DE BENEDICTIS, Head of the Agricultural Office of Eritrea, Asmara, transmitted by the Government of the Colony.

On 28 May, numerous locusts coming from Ghergher (Suela) after having destroyed the lands sown with maize in the districts of Medri Hebei, Dembè Uoddi, Filicos, Bigait, Grat Gaba, Danfaga, Cherenà Cudò and Hamasa (Deda), left the Hamasien territory, and made their way towards Seraè.

* * *

During June 1931 locust swarms were reported also in the western plain. On 1 June a swarm coming from the Sudan passed over Omager flying east; on the 16th and 19th more swarms were seen along the Barca and at Barentù.

On the 14th numbers of reddish locusts coming from the sea passed over Thiò, a district on the Red Sea coast.

On the 15th, 19th and 21st numbers of other swarms crossed into the territory of the Colony from Abyssinia. These locusts invaded Acchelè Guzai and the Seraè and then dispersed over the upland plateau.

On the 12th, 19th and 22nd swarms coming from the eastern plain flew towards the upland plateau, invading first the Hamasien and then the Seraè.

At Nacfa also on the 18th a swarm was observed coming from the west and flying part to the east and part to the southeast.

The reddish colour of the swarms of winged locusts showed they were not yet sexually mature, and no egg deposits were reported during the month.

The observation of the swarms is being continued as well as the destruction of any small centres of hoppers.

United States of America: An Outbreak of *Peronospora hyoscyami* on Tobacco (1).

An outbreak of *Peronospora hyoscyami* De By. on tobacco plant beds, the first reported in the United States since 1921, occurred in the spring of 1931. This is, of course, the well-known Blue Mold of tobacco in Australia. In contrast to the earlier outbreak which was confined to west Florida and two adjacent counties in Georgia, the disease this year was found in tobacco producing areas of six states.

Much interest was aroused by the presence of this unusual disease and its progress northward was carefully traced. There seems to have been a more or less regular periodicity in the successive outbreaks which followed each other at intervals of about two weeks. The first reports of the disease came from Louisiana and south Georgia, where the disease occurred on a few plant beds during the last half of March and the first half of April. About the middle of April the disease appeared almost simultaneously on a large number of plant beds in six counties of Georgia and within ten days had been found scattered over thirteen counties in this state. Early in May the disease was found for the first time in northwestern Florida and scattering infections were found in seven counties in the Coastal Plain region of North Carolina. By the middle of May the disease was found on approximately half the plant beds in several counties in North Carolina and had been reported from no less than sixteen counties, all of these on or near the Coastal Plain. By this time most of the plants in affected beds in Louisiana and South Georgia had largely recovered and less alarm was felt regarding the outcome of the disease. The disease continued to

(1) Communication from the official correspondent of the Institute, Dr. Neil E. STEVENS, Senior Pathologist, Plant Disease Survey, Bureau of Plant Industry, United States Department of Agriculture, Washington.

spread northward, however, and during the first half of June was found in the Piedmont region of North Carolina, adjacent counties of Virginia and South Maryland.

In spite of the threatening aspect of this disease, relatively little damage resulted. In many of the infected plant beds when the disease was at its height not a single healthy plant could be found, and the whole bed had the appearance of having been scalded with hot water. Within ten days or two weeks, however, most of the plants had recovered and showed apparently normal growth. The actual economic loss will be very slight.

United States of America : Notes on Nematodes Injurious to Plants (1).

The increasing interest in plant diseases due to nematodes is evidenced by the unusual number of reports of such diseases received during the current summer. Most of these reports come to the Plant Disease Survey through the courtesy of Dr. G. Steiner who has made the determinations of the nematodes involved.

Tylenchus dipsaci, the stem and bulb nematode was intercepted January 8, 1930 in potatoes in ship's stores which are believed to have come from Prince Edward Island. If this assumption is correct it constitutes the first record of this parasite on potatoes in North America. In July, a severe but strongly localized infection of *T. dipsaci* on onions was discovered in Canastota, Madison County, New York. This is the first report of this nematode in New York State and the first authentic report on this host in the United States. Every effort is being made to eradicate the pest in this area. This same nematode was reported for the first time on Sweet William (*Dianthus barbatus*), and *Plantago maritima* from Oregon during April, and on strawberries in North Carolina during May, also on *Hypochaeris radicata* from the Island of Maui, Hawaiian Islands (Godfrey). The disease of Sweet Potatoes caused by *T. dipsaci* appeared again in New Jersey where it is becoming generally known as the 'brown ring' disease. Observations to date indicate the disease is not widespread in New Jersey but where it occurs causes considerable loss in storage.

Aphelenchus fragariae, the cause of the cauliflower disease of strawberries in Europe (the disease is usually known as 'Dwarf' in the United States), was found to survive the winter on strawberries in southeastern Massachusetts.

Tylenchus pratensis de Mon. which is an endoparasitic form on roots, rhizomes, and tubers of many plants, is known to be widespread in Europe and Northern United States. Much interest is attached to finding this nematode causing a disease of yams shipped from West Africa as this is the first report from Africa and the first from yams (*Dioscorea* sp.).

Tylenchus pratensis was found on tobacco in North Carolina by Dr. S. G. Lehman during July, 1931. This is the first report of *T. pratensis* on tobacco. Dr. Lehman found the disease caused by the nematode was present in several fields in each of two counties. He described the conditions in diseased fields as follows : "The plants are very uneven in growth and the majority of them show slight to extreme stunting. The lower leaves are turning yellow and becoming necrotic around the margins. Although the grower has made a special effort culturally to stimulate the growth of these plants they have failed to grow as they should. One can readily pick out the diseased plants by their stunted appearance and the lower leaves with

(1) Communication from the official correspondent of the Institute, Dr. Neil E. STEVENS, Senior Pathologist, Plant Disease Survey, Bureau of Plant Industry, United States Department of Agriculture, Washington.

their yellow margins. The grower states that this tobacco has not grown as it should during the entire season. All summer it has shown a strong tendency to wilt, beginning about 9.00 o'clock in the morning and extending through the heat of the day until late evening. The leaves come up at night but wilt down again on the succeeding day. Many of the fine rootlets are killed back for a long distance from the tips. On the larger roots isolated lesions of various sizes are evident. The colour is distinctly brown, not black, and no spores are present such as are found in lesions of the black root rot diseases".

Aphelenchus parietinus. During March and April, 1931, extensive plantings of fifty varieties of cotton seed were made under the supervision of C. H. Arndt of the South Carolina Agricultural Experiment Station at Clemson College and Florence, South Carolina, to determine the relative ability of the various varieties or strains to produce stands under the low temperature of the early portion of the growing season. The germination of the seed was very variable, but small stands of most of the varieties were secured, particularly at Florence. Later the seedlings showed the typical symptoms of damping-off. From 60 to 90 per cent. of these seedlings were killed in the early stages of their development. Previous examinations of similarly diseased seedlings indicated that the lesions were not of the usual type produced by the fungi causing damping-off; although species of *Corticium* and *Fusarium* always developed when such seedlings were washed and placed on nutrient agar. Nemas were invariably found in such lesions. Several hundred seedlings, selected at random, were examined (by C. H. Arndt and two associates) from both of the places above noted with the following results as to the type of injury found on the seedlings: Nemas 70 to 80 per cent.; *Corticium* (typical sore-shin) 8 to 15 per cent.; *Fusarium* sp. 5 to 10 per cent. (species determined by Dr. C. D. Sherbakoff as *F. vasinfectum*, *F. viride*, *F. martii-minus*, *F. moniliforme*), an undetermined phycomycete 1 to 3 per cent.; normal plants, without lesions, not above 10 per cent.

United States of America: Outstanding Entomological Features (1).

The following notes refer to July, 1931.

The paramount feature of the month is the devastating grasshopper (Acrididae) outbreak in the Great Plains which is said to be the most serious of any since the early settlers were demoralized by the invasion of the Rocky Mountain locust, *Melanoplus spretus*, in the decade between 1868 and 1880. Serious grasshopper outbreaks were quite generally reported from New York westward to Idaho, Nevada, and Arizona, and southward to Arkansas, Oklahoma, and Texas.

The severe outbreak of the variegated cutworm, *Lycophotia margaritosa saucia* Hbn., which was reported during June in the West-Central States was followed in July by a similar outbreak of this same insect in the North-Central States.

Late sweet corn on over one thousand acres of land in San Diego and Los Angeles Counties, Calif., was practically ruined by an undetermined climbing cutworm (Noctuidae).

The fall armyworm, *Laphygma frugiperda* S. & A., appeared in destructive numbers in the Everglades of Florida and in the Mississippi delta of Louisiana during July. This is two months later than it appeared in destructive numbers in the Gulf Region last year.

(1) Communication from the official correspondent of the Institute, Mr. J. A. HYSLOP, Senior Entomologist in Charge, Insect Pest Survey and Public Relations, Bureau of Entomology, United States Department of Agriculture, Washington, D. C.

The painted lady butterfly, *Vanessa cardui* L., was quite generally reported from New England to the Dakotas, the larvae feeding on hollyhock and burdock.

The chinch bug, *Blissus leucopterus* Say, seriously damaged corn in southern Illinois, central Missouri, and southern and central Kansas. It also did some damage to this crop in northern Ohio. This insect seems to be building up an abnormal population north of the normal chinch-bug belt in South Dakota and Iowa.

The corn ear worm, *Heliothis obsoleta* Fab., was more numerous during July in the North-Central States than it has been for several years and in Nebraska is doing more damage during this July than any July in the past 30 years.

An interesting account of the variegated fritillary (*Euptoieta claudia* Cram.) doing commercial damage to beans, sweetpotatoes and melons in Tennessee was reported in late June.

The establishment of a considerable colony of *Bruchus brachialis* Fahraeus attacking vetch in the field near Haddon Heights, N. J. and infested material from Delaware and Maryland was discovered during the month.

The peak of the 1st-brood codling moth, *Carpocapsa pomonella* L., emergence in the Hudson River Valley occurred about July 7. The second brood moth started to emerge in central Ohio about July 9, but up to July 20 no emergence had been observed in the fruit belt along Lake Erie. Severe infestations were reported quite generally in the eastern part of the United States. Band counts in western Illinois indicate that the population is 10 times as great as at the same time last year, and in eastern Illinois about 25 times as great.

Considerable damage is being done by the grape leafhopper, *Erythroneura comae* Say, from New Jersey westward to Ohio.

Blister beetles (Meloidae) as usual are now attracting a great deal of attention on a variety of crops in the East-Central and West-Central States, Say's blister beetle, *Pomphopoea sayi* Lec., becoming quite numerous in New England and in New York.

The false chinch bugs, *Nysius ericae* Schill., are very numerous over a large area in Iowa and Nebraska. They are also numerous in parts of Texas, Colorado and South Carolina.

Colorado potato beetle, *Leptinotarsa decemlineata* Say, was discovered on a city lot in Ogden, Utah, during late June. By the end of July it appeared that this infestation had been eliminated.

Potato leafhopper, *Empoasca fabae* Harr., with the associated hopperburn is prevalent in the East-Central States, southward to Kentucky and westward to Iowa and Minnesota.

Larvae of the Mexican bean beetle, *Epilachna corrupta* Muls., were collected during the month in Washington County, Rhode Island. Considerable damage was done by the first generation of this insect in Connecticut. It was reported for the first time from Esopus and Port Ewen, New York. In the older infested region in the southern Middle Atlantic States but comparatively little damage is being done by this insect.

The squash bug, *Anasa tristis* De G., is being reported much more frequently than last year from the Middle Atlantic States, southward to Georgia, Alabama and Mississippi. It was also reported as doing serious damage in Iowa and Utah. In Idaho, where it was first discovered in 1929, it is now quite generally destructive over the southwestern part of the State.

A serious outbreak of the beet webworm, *Loxostege sticticalis* L., is occurring in parts of Wyoming. The insect is also unusually abundant in Montana, and

North Dakota. In Wyoming the insects seriously damaged beans into which they migrated from nearby fields.

The elm leaf beetle, *Galerucella xanthomelaena* Schr., was reported during July from New Hampshire southward along the Atlantic Coast to Maryland with occasional outbreaks in Ohio and Kentucky.

The spruce budworm, *Harmoloba fumiherana* Clem., is defoliating large areas of balsam fir and several species of pine in Wisconsin and parts of North Dakota. This insect was discovered for the first time in Cody Canyon, Wyo., in 1926, and since that time it has spread over a tremendous acreage and has destroyed large areas of Douglas fir.

About 43,000 acres of poplar has been defoliated in Maine by the Poplar leaf roller, *Cacoecia conflictana* Walk.

Eye gnats, *Hippelates* spp., have been very annoying along the South Atlantic seaboard from Maryland to Georgia and around the Gulf to Mississippi.

Hungary: Locusts (1).

After a complete respite since 1926, during 1930 the first signs of the influence of a series of dry years on the development of locusts began to be apparent. The Italian locust (*Calliptamus italicus*) in particular made its appearance in 1930 in several places; the swarms were small however and there was no serious damage nor was there need for large-scale control measures.

The Moroccan locust (*Doclostaurus maroccanus*), which attacks grain crops also appeared in 1930. It invaded only five communes however and only in small numbers. The Hungarian Entomological Station and the Ministry of Agriculture took the necessary steps to prevent risks of a recurrence in the following year.

In 1931 however a progressive development of the various species occurred. *Calliptamus italicus* made its appearance practically throughout the country and in such numbers that it was often necessary to protect the fodder, root and leguminous crops by collecting or burning the locusts. By these means serious damage was avoided.

The Moroccan locust also developed in great numbers in 1931. Although this species, which is considered the most destructive has invaded 27 communes more or less seriously this year it has certainly not yet reached its maximum development. In the single commune of Sövényháza in the 'Comitat' of Csongrád the locusts invaded an area of some hectares in such mass that they were soon short of food and attacked the neighbouring wheat crops. Control measures were at once undertaken with machines fitted with wire brushes and had such good results that, at the end of the operations, it was found that the loss was confined to only slight damage to 5 hectares of wheat distributed among several estates.

From the degree of infection of the invaded centres the need for a more intensified campaign in 1932 is to be expected. All the necessary measures that are possible in the difficult economic situation will be taken to prevent a locust invasion in 1932.

As was to be expected from biological and ecological knowledge of the Orthoptera, other species also have extended their attacks this year. The most serious have been *Gryllus desertus* and *Platypleis griseus*. They have been controlled in their breeding grounds (pasture and meadowland), the former by means of arsenical sprays, the latter with tooth-harrows.

(1) Communication from the official correspondent of the Institute, M. G. BAKÓ, Director of the Royal Hungarian Entomological Station, Budapest.

India : Some Fungal Diseases of Farm Crops Recently discovered in the Punjab (1).

(1) Grain smut (*Sphacelotheca Sorghi* (Lk.) Clinton) of jowar (*Andropogon Sorghum* Brot.). — This disease has been under observation for the last two years. It causes damage to the extent of 30-50 per cent in Dera Ghazi Khan District, South-West of the Punjab near hills. As the disease is carried by means of spores, which stick to the surface of the grain, treatment with copper carbonate dust at the rate of two ounces for twenty pounds of grain has been tried and found to be very effective.

(2) Long smut (*Tolyposporium filiferum* Busse) of jowar. — This disease was noticed in 1929 in the Multan District, South-West of the Punjab. Usually it occurs in Sind in the Bombay Presidency. Although it is not generally found in this Province, but it is likely to spread. The life-history of the fungus is not fully worked out and the study will be undertaken as soon as possible.

(3) Flag smut of wheat (*Urocystis Tritici* Koern.). — This disease has been reported for the first time from Ropar Tahsil in the Ambala District. In some places the extent of occurrence is as high as 25 to 30 percent. In 1930 it was observed in traces in Gurdaspur. Generally it appears in the sub montane tracts and has not been found in the plains. Measures for the control of the disease by means of disinfection of seed will be taken.

(4) Diseases of grape vines (*Vitis vinifera* Linn.):

(i) Black-rot of grapes (*Guignardia Bidwellii* (Ellis) Viala and Ravaz). — It affects the fruit of the grape vine commonly in the Punjab and a considerable damage has been done. Spraying with Bordeaux mixture has been found useful.

(ii) Grape anthracnose (*Gloeosporium rufo-maculans*). — This disease is found associated with Black-rot and affects all the green parts of the vine. The fruit and the shoots are, however, more affected. Bordeaux mixture has been found useful in this case also.

India : A New Minor Pest on Cotton in Burma (2).

A Capsid bug, not identified, has been observed to occur in large numbers and to breed on Cambodia and Acala cottons at Mandalay.

LEGISLATIVE AND ADMINISTRATIVE MEASURES

Germany (Hamburg) (3). — By Police Order of 20 June 1931 the clearing of thistles on 'Geestlande' before the 1st July of each year has been made compulsory; the owner as well as the usufructuary of the land will be held responsible for the carrying out of the Order. In the event of anyone failing to clear the thistles within 3 days of receiving a written notice to that effect the Commune will be authorised to carry out the work at the expense of the offender.

(1) Communication from the official correspondent of the Institute, Mr. R. S. L. JAI CHAND LUTHRA, M. Sc., D. I. C. (London), I. A. S., Professor of Botany, Punjab Agricultural College, Lyallpur.

(2) Communication from the official correspondent of the Institute, Mr. C. C. GHOSH, B. A., F. E. S., Entomologist, Agricultural College, Mandalay, Burma.

(3) Communication from the Biologische Reichsanstalt für Land- und Forstwirtschaft, Berlin-Dahlem, official correspondent of the Institute.

Italy. — By Decree of the Ministry of Agriculture and Forests, dated 21 June 1931, a competition has been opened for the compilation of a 'Manual of diseases of crop plants' and a 'Manual of insect pests of crop plants' for use in the instruction of the peasants. The successful competitor will receive an award of 10,000 liras for each volume, and there will be two second prizes of 2000 liras each for each volume. The closing date for the competition is 31 December 1931. (*Gazzetta Ufficiale del Regno d'Italia*, Roma, 24 settembre 1931, anno 72^o, n. 221, p. 4692).

*** By Ministerial Decree of 16 September 1931 the provincial Hunting Commission of Sassari has been authorised to carry out a wholesale slaughter of wild boars in the 'La Nurra' district to reduce their numbers which have become a danger to farming. (*Gazzetta Ufficiale del Regno d'Italia*, Roma, 22 settembre 1931, anno 72^o, n. 219, p. 4641).

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INTERNATIONAL BULLETIN OF PLANT PROTECTION

DISCOVERIES AND CURRENT EVENTS *

French West Africa: Desert Locust (*Schistocerca gregaria*) (1).

Swarms observed during July 1931:—

1st, some swarms at Djiler, 'cercle' of Kaolach, Senegal.

2nd, one swarm at Gouré, Niger.

3rd, a swarm at Savé, 'cercle' of Savalou, Dahomey; a swarm at Canton Sokone, Kaolach, Senegal and laying reported; a swarm at Canton Sahoué, Mono, Dahomey;

6th, a swarm at Abomey, 'cercle' of Savalou, Dahomey; a swarm at the villages of Tokoli, Akandjamé and Tori Heuvié, 'cercle' of Allada, Dahomey.

7th, hatching of hoppers at Coundoum-Keur - Mandongokeur - Maniébé Kaolach, Senegal, two swarms in the region of Abomey-Calavi and in the Canton of Couffo, Dahomey.

8th, hatching of hoppers 2 kilometres north of the douar of Gouné, farm-school of Kakoro, 'cercle' of Guidimakha, Mauritania.

11th, a swarm at Tikat-Birkelane, Senegal.

11th, 12th and 13th, swarms at Lougné, Djigui, Affia, Diandienne, Kataké-Petté, Kaolach, Senegal.

18th the whole region south of Savalou, Dahomey between the valleys of the Zou and the Onème, was invaded by numerous swarms causing serious damage to the maize crops.

20th, a swarm at Atar, Senegal.

Algeria: Desert Locust (*Schistocerca gregaria*) (1).

During July 1931 swarms were observed at Polignac, Southern Territories on the 5th and 7th, a small swarm at Mokta-Déli, Méchéria on the 8th, and on the 16th a swarm at Moghrar-Tahtani, Aïn-Sefra.

Eritrea: The Desert Locust (*Schistocerca gregaria*) and the Tropical Migratory Locust (*Locusta migratorioides*) (2).

The swarms observed in June along the Barca and coming from the Sudan flew in the direction of the uplands, invading the Seraè and the Acchelè Guzai.

In addition to *Schistocerca gregaria* they consisted largely of *Locusta migratorioides*.

* In this, as in the next chapter, the countries are arranged in French alphabetical order.

(1) Communication from the Government General of Algeria, Algiers, to the International Institute of Agriculture.

(2) Communication from the official correspondent of the Institute, Dr. A. DE BENEDICTIS, Head of the Agricultural Office of Eritrea, transmitted by the Ministry of the Colonies (Office of Studies and Propaganda).

The first appearance of this latter species in the upland plain was on 14 July at Adi Ugrì.

The masses of *L. migratorioides* after crossing over Adi Ugrì flew in the direction of the plain of the Hazamò.

On the 4th and 8th numerous desert locusts (*S. gregaria*) entered the Colony from the Tigrai; on the 11th and 15th they were seen in the neighbourhood of Senafè, flying towards the Assaorta.

Although the swarms coming from over the Abyssinian border were in July greatly less than those reported during the same period last year, from the Anglo-Egyptian Sudan large swarms of *L. migratorioides* daily invaded the territory of Eritrea and reached the uplands by way of the valleys of the Barca and the Gasc.

On 20 July a dense swarm of reddish-coloured locusts coming from the north (Aisera Valley) alighted in the Tabeh valley, and took flight again the same day towards the south.

About 10 July some swarms consisting of sexually mature locusts laid eggs in the plains of Faulinà, Gurgura and Mai Ceù; on the 27th other egg deposits were reported along the Aidereso stream, and on the 28th and 29th in the district between Darotai and Agordat.

Towards the end of July hoppers appeared in the Faulinà plain, in the region between the Sittona stream and Gomò (Barentù) and between Ummed and Darotai (Agordat).

An active watch was kept in the egg contaminated zone, which agreed to intervention by the squadrons quartered in the different Commissariats of the Colony for the distribution of poisoned bait.

Serious damage was done to crops of dura, taf, dagussa and wheat in the Barentù territories, along the Anseba, in the Seraè and in the Scimenzana.

During August 1931 numerous swarms of locusts coming from the Anglo-Egyptian Sudan and from across the Abyssinian frontier passed over the territory of Eritrea. Those which came from the east were composed for the most part of *L. migratorioides*, those from the south of *S. gregaria*. Abundant hoppers were hatched in the territory of Barentù, along the Gasc, the Barca and in many other localities in the western plain.

In the uplands egg laying was reported on the 5th near the villages of Adi Mescela and Chila Mella in the Zaid Accolom (Seraè) and on the 19th in the plain of the Hazamò, and hatching at Adi Samiel (Seraè).

The swarms from Abyssinia, consisting of desert locusts, flew partly in the direction of the eastern and partly in the direction of the western plains. On the 1st, 4th, 20th and 21st dense swarms were observed near Saganeiti, Adi Caièh and Senafè flying towards the north-east; on the 25th and 29th two swarms of sexually mature desert locusts were reported in the vicinity of Zula and Mount Ghedem (eastern plain). In the western plain on the 2nd a swarm of desert locusts flying west passed over Omager, and on the 3rd another swarm, also flying west, was seen near Tessenei.

On the 16th in the neighbourhood of Carora (eastern plain) great numbers of locusts coming from the north flew in the direction of the Sciamile plain.

It is to be noted that the swarms of *L. migratorioides* reported on the 12th and 17th flying east, had by the 20th reached the Red Sea. Unlike last year hoppers were not found in August in the upland plateau. The western lowlands on the other hand were badly infested.

The destruction of hoppers was actively continued by the Government gangs.

and by the natives. In the territory of the Residency of Tessenei alone some hundreds of quintals were destroyed.

The risk of invasion in autumn by winged swarms coming from over the Abyssinian and Sudan frontiers still remains.

In August damage was reported to dura crops at Ducambia, Biscia and along the Anseba ; to the barley in the Maria Rossi ; and to dagussa and taf in the Tedrer (Acchele Guzai), Decchi Bocrù and Aila in the Seraë.

United States of America : Outstanding Entomological Features (1).

The following notes refer to August, 1931.

The serious outbreak of grasshoppers in the Great Plains region which developed during July continued through the greater part of August, with lesser outbreaks over practically the entire country.

Red spiders (*Tetranychus telarius* L.) of several species attacking a great variety of plants, including forest and shade trees, truck crops, flowers, fruits, and shrubs, were reported from scattered localities across the northern part of the United States, from Maine through South Dakota and Idaho to Utah and Oregon.

A few specimens of the European corn borer (*Pyrausta nubilalis* Hbn.) was discovered for the first time in the State of Wisconsin, having been found in a field in Mosel township, Sheboygan County, on Lake Michigan.

The Japanese beetle (*Popillia japonica* Newm.) has been collected at Cleveland and Columbus, Ohio, these being the first records for this State.

The corn ear worm (*Heliothis obsoleta* Fab.) continued to be reported as unusually abundant from practically the entire corn-growing area of the United States.

A very unusual outbreak of chinch bugs (*Blissus leucopterus* Say) occurred at Windsor, Berkshire County, Mass. The outbreak was not extensive but the insects occurred in enormous numbers over a small area of corn and millet. The chinch bug situation as a whole in the Middle West has not changed materially since last month, although the insect has been reported this month from the lower tier of counties in Michigan and the southeastern corner of Minnesota.

The garden webworm (*Loxostege similalis* Guen.) was reported as seriously damaging alfalfa in scattered localities from Indiana to North Dakota and Iowa.

Sod webworms (*Crambus* spp.) was unusually destructive to lawns, golf greens, and pastures from Ohio westward to North Dakota and southward to Missouri and Tennessee.

The codling moth (*Carpocapsa pomonella* L.) situation has not changed materially since July. This insect continues to be seriously prevalent from New York southward to Georgia and in scattered localities from the East Central States, westward to the Pacific Northwest.

The oriental fruit moth (*Laspeyresia molesta* Busck) has been found at Springdale, Ark., this year. This is the first record from northwestern Arkansas.

The grape leafhopper (*Erythroneura comes* Say) was very seriously abundant throughout the northern part of the San Joaquin Valley in California where it is said that they will materially reduce the marketable tonnage of grapes.

The Pacific red spider (*Tetranychus pacificus* McG.) was extremely numerous late in July on grapes, deciduous fruits, and ornamentals in central California. Early in August this insect was practically eliminated by the predacious thrips *Scolothrips sexmaculatus* Perg.

(1) Communication from the official correspondent of the Institute, Mr. J. A. Hyslop, Senior Entomologist in Charge, Insect Pest Survey and Public Relations, Bureau of Entomology, United States Department of Agriculture, Washington, D. C.

An unusual damage to citrus is reported from Los Angeles, Calif. The false chinch bug (*Nysius ericae* Schill.) is seriously damaging young trees in groves adjoining wheat and weed fields.

The second finding of Cardin's whitefly (*Aleurodicus* [*Metaleurodicus*] *cardini* Back.) in the United States is recorded. Specimens were collected on guava in moderate abundance at West Palm Beach, Fla. The first finding was in February, 1921, when specimens were collected by W. B. Wood, of the Plant Quarantine and Control Administration, in the Plant Introduction Gardens at Miami.

Blister beetles (Meloidae) were quite prevalent throughout the entire Mississippi Valley from Indiana, Minnesota, and North Dakota southward to Louisiana and Mississippi.

The plant bug *Engytatus geniculatus* Reut., was recorded from the first time as a pest of tomatoes in Orange County, Calif. This insect is said to be injurious to tomatoes in the Hawaiian Islands.

Late in July the Mexican bean beetle (*Epilachna corrupta* Muls.) was found at Brattleboro, this being the first record for the State of Vermont. This insect is extremely prevalent and destructive throughout the northern part of its range, particularly north of the drought area of 1930.

Two coreid bugs, *Alydus eurinus* Say and *A. pilosulus* H. S., were found seriously injuring beans in Georgia.

During the last week of August the sugar-beet webworm (*Loxostege sticticalis* L.) developed in rather large numbers in parts of North Dakota, South Dakota, and Utah.

Many fields of peppers in southern California have been damaged from 25 to 40 per cent. by the pepper weevil (*Anthonomus eugenii* Cano).

The weevil *Trichalophus didymus* Lec. has been found infesting strawberry crowns on the mainland at Tacoma, Wash. Heretofore this insect has only been known from Whibley Island, Washington.

For the first time in many years the potato tuber moth (*Phthorimaea operculella* Zell.) was injurious to tobacco in Dane, Rock, and Jefferson Counties, Wisconsin.

The bagworm (*Thyridopteryx ephemeraeformis* Haw.) was quite generally reported from Pennsylvania westward to Indiana and Kansas, and southward to Mississippi.

The saddled prominent (*Heterocampa guttivitta* Walk.) which has been in outbreak numbers in New England during the past few years, seems to have reached its peak during 1930 and this year is appearing in considerably reduced numbers.

The fall webworm (*Hyphantria cunea* Drury) is very abundant throughout New England and the Middle Atlantic States.

The elm leaf beetle (*Galerucella xanthomelaena* Schrank) was found early this spring in the Yosemite National Park in California. This is the first record of this insect in the Park.

The gladiolus thrips (*Taeniothrips gladioli* M. & S.) is very seriously injuring gladiolus in the New England, Middle Atlantic and East Central States.

Hungary: New or Rare Cryptogamic Diseases (1).

The following list leaves out of account the common diseases and enumerates only those rare or new for Hungary which were observed during 1929 and 1930. The diseases which are new for the country are marked with an asterisk:—

(1) Communication from the official correspondent of the Institute, Mr. Hermann KERN, Director of the Royal Hungarian Station of Physiology and Plant Pathology, Budapest.

1929

Pseudopeziza Medicaginis Sacc.
Fusarium niveum E. F. Sm.
Uromyces Fabae (Pers.) De By.
Bacillus Phaseoli E. F. Sm.
Bacillus Sorghi Burr.

Erysiphe Cichoriacearum DC.
Alternaria Brassicae Sacc.
Sclerotinia sclerotiorum (Lib.) DeBy.
 * *Pseudomonas Pisi* Sack.
Ustilago Panic-miliacei (Pers.) Wint.
Peronospora Brassicae Gáum.
Cladosporium macrocarpum Preuss.
Stigmatea Mespili Sor. f. *maculata* (Kleb.) Appel
Puccinia Caricis Reb.
Pseudomonas tumefaciens E. F. Sm. et Townsend
Ophiobolus graminis Sacc.

Severe frosts early in 1929 caused considerable damage to many crops.

1930

Uromyces caryophyllinus (Schr.) Schröter
Heterosporium variabile Cooke
Puccinia Caricis Reb.
Pseudomonas spongiosa (Aderhold et Ruhland) Braun
Exosporium palmivorum (Sacc.) Cooke
Actinonema Rosae Fr.
Sphacelotheca Sorghi (Lk.) Clinton

Pseudopeziza Trifolii (Biv.-Bern.) Fckl.
Peronospora Trifoliorum DeBy.
 * *Sclerotinia Fuckeliana* DeBy.
 * *Botrytis cinerea* Pers.
Oidium Euonymi-japonici (Arc.) Sacc.
 * *Sclerotinia Nicotianae* Oud. et Kon.
Ophiobolus graminis Sacc.

on *Medicago sativa*.
 » *Citrullus Colocynthis*.
 » *Lens esculenta*
 » *Phaseolus vulgaris*.
 » *Sorghum halepense* var. *sudanense*.
 » *Cucumis sativus*.
 » *Raphanus sativus*.
 » *Helianthus annuus*.
 » *Pisum sativum*.
 » *Panicum miliaceum*.
 » *Brassica oleracea*.
 » *Spinacia oleracea*.
 » *Pyrus communis*.
 » *Ribes Grossularia*.
 » roots of various fruit trees.
 » grain crops

on *Dianthus* sp.
 » *Spinacia oleracea*.
 » *Ribes Grossularia*.
 » *Prunus Armeniaca*.
 » *Phoenix* sp.
 » *Rosa* sp.
 » *Sorghum halepense* var. *sudanense*.
 » *Trifolium incarnatum*.
 » " "
 » *Solanum tuberosum*.
 » " "
 » *Euonymus japonicus*.
 » *Nicotiana Tabacum*.
 » cereals.

Mauritius: Notes on Insect Pests (1).

An invasion of caterpillars was noticed in April, May and June, after a cyclone which ravaged the island from the 5th to 8th of March, 1931. The cutworm *Prodenia litura*, F. and *Spodoptera mauritia*, Bdv. were especially troublesome in vegetable and tobacco plantations.

Papilio demodocus, Esp. developed abnormally in large numbers so as to constitute a serious pest to Citrus trees.

This invasion is imputed to the destruction by the cyclone of the natural enemies of the caterpillars combined with meteorological conditions favouring the development of these insects.

(1) Communication from the official correspondent of the Institute, Mr. VINSON, Scientific Assistant to the Entomological Division, Department of Agriculture, Reduit, Mauritius.

On the other hand Coccid pests such as *Icerya seychellarum*, West. have been entirely wiped out in certain localities by the cyclone and have not reappeared since.

Lachnosterna (Phytalus) smithi, Arrow. — This scarabeid beetle is still the major pest of sugar cane in certain parts of Mauritius. During the season 1930-31, 234 ½ million beetles and 64 million grubs were captured at a cost of Rs. 66,000 and Rs. 19,000 respectively.

A Scoliid wasp, *Elis* sp., the parasite of *Lachnosterna rodriguezi*, Waterh. and *L. gradaria*, Waterh. in Rodriguez was introduced from that country and it is hoped that in Mauritius this *Elis* will constitute a third parasite of *Lachnosterna smithi* already parasitised by *Tiphia parallela* (Smith) introduced from Barbados and *Elis thoracica*, F. introduced from Madagascar.

New South Wales : Plant Diseases (1).

Notes on plant diseases in New South Wales during year ending June 30th 1931 :—

CEREALS AND FIELD CROPS.

W h e a t . Stem rust (*Puccinia graminis tritici*) developed extensively throughout the wheat belt and in some sections caused serious damage. Mild winter conditions caused succulent growth and heavy rains in the spring favoured development of the disease.

Flag-smut (*Urocystis tritici*) was widespread but generally caused less damage than in previous years.

Foot-rot (*Helminthosporium sativum*) caused serious reduction in yield in crops which were predisposed to the disease by "feeding off", rust and frost.

Take-all (*Ophiobolus graminis*) was also recorded from a number of localities.

Leaf Spot (*Septoria tritici*) caused much more damage than usual, particularly in the later maturing varieties.

Diseases of less importance included Bunt (*Tilletia tritici*), Loose Smut (*Ustilago tritici*), Glume Blotch (*Septoria nodorum*), Basal glume rot (*Bacterium atrofaciens*) and Powdery Mildew (*Erysiphe graminis*).

Non-parasitic conditions included "haying-off" and "tipping", as a result of dry weather conditions and strong winds during the early stages of maturity.

O a t s : Stem rust (*Puccinia graminis avenae*), Loose Smut (*Ustilago avenae*) and Covered Smut (*U. levis*) were recorded.

B a r l e y : Covered Smut (*Ustilago hordei*), and Loose Smut (*U. nuda*) were prevalent. Stripe (*Helminthosporium gramineum*) was recorded from one locality.

R y e : Loose Smut (*Ustilago tritici*) was observed for the first time in this State.

M a i z e : Root and stalk rots (*Fusarium moniliforme* and *Gibberella saubinetii*) and Dry rot (*Diplodia zeae*) were fairly prevalent throughout all maize growing districts. The Cob-rot condition caused by *Fusarium moniliforme* was more than usually severe and was associated with comparatively heavy autumn and winter

(1) Communication from the official correspondent of the Institute, Mr. R. J. NOBLE, Ph. D., M. Sc., B. Sc. Agr., Biologist, Department of Agriculture, Sydney, New South Wales.

rains. Cob-rot (*Basisporium gallarum*) was recorded for the first time in this State. Leaf Blight (*Helminthosporium turcicum*) and Rust (*Puccinia sorghi*) were very prevalent on coastal areas which had been continuously cropped for some years.

Sorghum: Red Stain caused by *Colletotrichum* sp. and *Fusarium moniliforme* was prevalent in coastal areas. A bacterial disease of Sudan grass was attributed to *Bacterium holcicola*.

Rice: A non-parasitic condition involving spikelet sterility and a brownish or greyish discoloration of the glumes was prevalent on the Irrigation Areas. Up to 10 % of the crop was affected in several instances. The condition was attributed to the action of frost and low temperatures combined with drying winds at the heading out stage. Downy Mildew (*Sclerospora macrospora*) was recorded from the first time on this crop.

Lucerne: Rust (*Uromyces stratus*), Leaf Spot (*Pseudopeziza medicaginis*) and Downy Mildew (*Peronospora trifoliorum*) were more widespread than usual. Stem nematode (*Tylenchus dipsaci*) was recorded from additional areas.

A rosetted or spindle-shoot condition of unknown cause is widespread in lucerne growing areas. Infections generally do not exceed 2 per cent. of the crop.

Tobacco: Blue Mould (*Peronospora* sp.) caused serious losses in seed beds. Black Root Rot (*Thielavia basicola*) caused more damage than in the previous season.

Soy Beans. Bacterial Blight (*Bacterium glycineum*) and Bacterial pustule (*Bacterium phaseoli sojense*) were recorded in one locality.

Peanuts: Defective germination was caused by *Aspergillus niger* which caused rotting of stems and cotyledons.

FRUIT CROPS.

Apples: Black Spot (*Venturia inaequalis*) was the most serious disease recorded. Powdery Mildew (*Podosphaera leucotricha*) was of less importance.

Physiological diseases included Internal Cork (Crinkle), Orchard pit and Water-core. Malformation caused by faulty pollination was associated with adverse weather conditions at blossoming.

Pears: Black Spot (*Venturia pirina*) seriously affected pears in certain districts.

Stone Fruits: Brown-rot (*Sclerotinia fructicola*) caused damage in coastal districts. Sour-sap (cause unknown) was also serious: 50 % of the trees showed the condition in several orchards.

Rust (*Tranzschelia punctata*) caused serious damage in coastal districts and also in inland irrigation areas. Freckle (*Cladosporium carpophilum*), Leaf Curl (*Exoascus deformans*) and Crown Gall (*Bacterium tumefaciens*) were of less importance.

Grapes: Downy Mildew (*Plasmopara viticola*) and Black Spot (*Gloeosporium ampelophagum*) caused serious damage in areas in which spraying had been neglected.

Citrus: Black Spot (*Phoma citricarpa*) seriously affected oranges and lemons. Brown Spot of mandarin (causal agency undescribed) was widespread in coastal districts. The average infection approximated 20 per cent. of the crop.

Scab (*Sporotrichum citri*) caused up to 100 % infection in lemons in unsprayed orchards. The average infection amounted to about 15 per cent. of the crop.

Root-rot (*Armillaria mellea*) was of little importance. Melanose (*Phomopsis citri*) was confined mainly to old orchards.

The Stem-end Rot (*Phomopsis citri*) was of less importance. Twig Blight (*Septobasidium* sp.) was of little importance although more prevalent in humid areas.

Brown-rot (*Phytophthora hibernalis*) caused up to 100 % infection in fruits in low lying areas.

Psorosis (Scaly Bark) was of minor importance. It occurs mainly on old and somewhat neglected orchards.

Physiological troubles of slight importance include Folioecellosis, Exanthema and Crinkle.

Citrus root nematode (*Tylenchulus semipenetrans*) is widely distributed but causes little damage.

Strawberries: Leaf Spot (*Mycosphaerella fragariae*) and Leaf Scorch (*Mollisia earliana*) were fairly prevalent.

VEGETABLE CROPS.

B e a n s : Bacterial Blight (*Bacterium phaseoli*) was the most serious and widespread disease attacking Canadian Wonder beans. Mosaic was also prevalent in this crop.

Anthracnose (*Colletotrichum lindemuthianum*) was prevalent in winter crops, but losses were obscured by the incidence also of Bacterial Blight.

Angular Leaf Spot (*Isariopsis griseola*) and Root-rot (*Fusarium* sp.) were of less importance.

P e a s : Leaf Spot (*Ascochyta pisi*) and Blight (*Ascochyta pinodella*) caused most damage in metropolitan areas. Other diseases included: Bacterial Blight (*Bacterium pisi*), Root-rot (*Fusarium* sp.), Septoria spot (*Septoria pisi*), Downy Mildew (*Peronospora viciae*) and Powdery Mildew (*Erysiphe polygoni*).

C a b b a g e s a n d c a u l i f l o w e r s : Diseases recorded in these crops included Black-leg (*Phoma lingam*), Black Rot (*Bacterium campestre*), Club-root (*Plasmiodiophora brassicae*), Downy Mildew (*Peronospora parasitica*), Leaf Spot (*Cercospora* sp.) and Bacterial Spot (*B. maculicola*).

Whiptail (cause undetermined) caused serious damage in crops of cauliflowers; in some instances 100 % of the crops were affected.

M e l o n s , s q u a s h e s , e t c . The following diseases were recorded: Root-rot (*Fusarium nivium*), Powdery Mildew (*Erysiphe cichoracearum*), Macrosporium blight (*Macrosporium cucumerinum*) and Septoria Leaf Spot (*Septoria cucurbitacearum*).

O n i o n : Downy Mildew (*Peronospora schleideni*) caused widespread infections on coastal areas.

Potatoes: Virus diseases caused most serious losses. Leaf Roll was recorded to the extent of 30-50 % in some districts. Mosaic was less important. The following diseases were also recorded: Late Blight (*Phytophthora infestans*), Fusarium wilt (*Fusarium oxysporum*), Early Blight (*Alternaria solani*), Scab (*Rhizoctonia solani* and *Actinomyces scabies*).

Tomatoes: Spotted wilt (virus) caused serious losses in individual crops. Mosaic (virus) and Rosette (unknown cause) were also present.

Late Blight (*Phytophthora infestans*) and Early Blight (*Alternaria solani*) caused minor losses. Fusarium wilt (*Fusarium lycopersici*) caused damage in susceptible varieties although losses were not as serious as in previous years. Verticillium wilt (*Verticillium* sp.), Septoria Leaf Spot (*Septoria lycopersici*) and Blossom End Rot (physiological) were also recorded.

MISCELLANEOUS PLANTS.

Chrysanthemum: Nematode disease (*Aphelenchus ritzema-bosi*) caused serious damage in one commercial area of these plants.

Roses: The following diseases were recorded. Rose wilt and dieback (virus), Root-rot (*Armillaria mellea* and *Hypholoma fasciculare*), Crown Gall (*Bacterium tumefaciens*), Black Spot (*Actinonema rosae*) and Mildew (*Sphaerotheca pannosa*).

Seychelles: Coconut Pests (1).

We have received lately the visit of Mr. Stockdale, Agricultural Adviser of the Colonial Office, and have been recommended by the latter for assistance from the Home Government in order to attach temporarily to this Colony the services of an expert entomologist in the biological control of scale insects. This Colony has been badly suffering for the last 10 years from scale insects' attack.

The coconut trees which form our staple crop have been so heavily blighted by three of these insects (*Aspidiotus ficus*, *Pinnaaspis buxi* and *Ischnaspis filiformis*) that this industry is on the verge of becoming an unpaying proposition.

We are anxiously looking forward to the possibility of introducing new predators which will help us to keep down these pests. At present they are very unsatisfactorily controlled by a few species of parasitic fungi which develop spasmodic epidemics manifestly insufficient to keep down the pests. However our entomogenous fungus (*Pseudomicrocera Henningii*) is making headway in combating *Ischnaspis* and another white fungus (not yet identified) is also ridding plantations of *Pinnaaspis* scales.

Switzerland: An Occasional Parasite on the Vine (2).

At the end of May 1931 the appearance was noted on certain vineyards in the neighbourhood of Morges of a small greenish black caterpillar attacking the young leaves and buds of the vine.

The insect is one of the Tortricidae, *Cnephasia wahlbomiana*, of very variable

(1) Communication from the official correspondent of the Institute, Mr. P. R. DUPONT, Director of Agriculture, Seychelles.

(2) Communication from the official correspondent of the Institute, Dr. H. FAES, Director of the Station Fédérale d'essais viticoles, Lausanne (Montagibert).

colouring, with a grey-brown basis. The species which is widely spread is found all over Europe and extends to Japan.

The caterpillars observed this spring were from 6 to 8 mm. in length, and dark coloured, black or greenish black with pale brown head. Frequently the colour is much lighter.

The caterpillar of this *Cnephasia* is distinguished from that of other Tortricidae by its habit of rolling up at the least touch. It lives on a number of low growing plants, wild or cultivated, and in certain circumstances passes to the vine where it does only a slight amount of damage.

It is thus a question of an occasional parasite which need cause no anxiety to the vine growers of this country.

This caterpillar like many others is easily kept down by applications of the copper-arsenical mixture.

LEGISLATIVE AND ADMINISTRATIVE MEASURES

Germany (Anhalt) (1). — The Regulations of 23 September 1931 for the prevention of danger to human health from the preparations used in the control of rats and mice, state that these preparations are not without danger, specially for children and persons suffering from intestinal disorders. Such persons should not be employed in the preparation or distribution of the bait. Directors of works for this purpose are obliged to inform their employees of the precautions to be taken, such as not to eat or smoke during work and to wash the hands thoroughly with warm water and soap. The preparations must not be manufactured or mixed with bait in inhabited rooms, kitchens, etc. Any receptacle or instrument used in such work must be disinfected in boiling water for at least one hour after use.

It is forbidden to use bacterial preparations round wells, in or about inhabited houses, in slaughterhouses and in any premises used in the preparation or storage of foodstuffs or forage.

The preparations must be isolated from all forage and foodstuffs and placed in such a way that strangers cannot come near them.

Germany (Lower Silesia) (1). — By an Order of 11 July 1931 regulations concerning elm disease (*Graphium ulmi*) have been prescribed for the district of Breslau which are fundamentally similar to those contained in the Order of 31 March 1931 of the Free State of Bremen (see this *Bulletin*, 1931, No. 6, p. 97).

Germany (Thuringia) (1). — By Police Order of 15 July 1931 all owners or holders of land are obliged to cut all thistles before they come into flower. The Communal authorities must every year publicly order the destruction of thistles. A committee composed of representatives of the authorities and of the farmers must inspect the land and before July 15 of each year make a report to the authorities of the district. In any case of neglect the necessary work will be carried out by the police at the expense of the defaulter.

(1) Communication from the Biologische Reichsanstalt für Land- und Forstwirtschaft, Berlin-Dahlem, official correspondent of the Institute.

Colombia (Republic of). — By Presidential Decree No. 1128 of 30 June 1931 the Plant Sanitary Service for the ports and frontier stations was organised. (República de Colombia. Ministerio de Industrias. *Boletín de Agricultura*, Bogotá, 1931, año IV, núms. 3 y 4, págs. 149 a 153).

Italy. — By Ministerial Decree of 14 and 20 August 1931 the communes of Sarnano and Petriolo in the province of Macerata have been declared infected with grape phylloxera. (*Gazzetta Ufficiale del Regno d'Italia*, Roma, 22 agosto 1931, anno 72º, n. 193, p. 4184; 25 agosto 1931, n. 195, p. 4213).

*** By Ministerial Decree of 18 September 1931 the Communes of Roccabascerana and Lioni (province of Avellino) were declared infected with grape phylloxera. (*Gazzetta Ufficiale del Regno d'Italia*, Roma, 25 settembre 1931, anno 72º, n. 222, p. 4708).

*** By Ministerial Decree of 26 September 1931 the Commune of Vicoforte in the province of Cuneo was declared infected with grape phylloxera (*Gazzetta Ufficiale del Regno d'Italia*, Roma, 6 ottobre 1931, anno 72º, n. 231, p. 4883).

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(1) Communication from the official correspondent of the Institute, Miss E. M. DODGE, M. A., D. Sc., F. I. S., Principal Plant Pathologist, Plant Pathological Section, Division of Plant Industry, Department of Agriculture, Pretoria, Union of South Africa.

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INTERNATIONAL BULLETIN

OF PLANT PROTECTION

DISCOVERIES AND CURRENT EVENTS *

Algeria : The Presence of *Merodon geniculatus* in the Vicinity of Algiers (1).

On 7 March 1931 the withering and death of numbers of bulbs of ornamental Amaryllidaceae were reported at Rouïba near Algiers. The bulbs, certain of which were very valuable, were found to be attacked internally by the reddish larvae of a Syrphid, *Merodon geniculatus*, Strobl. Some already contained nymphs even at this season. The tissues round the attacked zone were liquified into a reddish brown deliquescent jelly in which a number of other insects were living.

Breeding experiments at the Insectarium of the Experimental Gardens of Hamma showed that the first hatching took place on 14 April, the main hatching from 20 to 25 April and the end of hatching on 15 May.

Dr. Villeneuve, who kindly identified the species, reported that the life history of this *Merodon*, examples of which he had obtained previously only from Orléansville and Spain, was absolutely normal, the larvae living in the bulbs of Liliaceae and specially in those of the genus *Narcissus* of the Amaryllidaceae.

Seeing that the *Diptera cyclorhapha* have several larval moults and that the pupal stage begins as soon as the genital glands are mature it was to be expected that laying should occur soon after hatching. The sample confirmed the rule :— on 25 August a further consignment reached us from the same place as the first containing also larvae and nymphs of the Dipteron.

The principal hatching was recorded on 10 September.

Meanwhile a treatment had been started, steeping the bulbs in a decoction of *Derris*. The negative result obtained showed the inefficiency of this treatment. Now the effect of spreading crude naphthaline at the experimental dose of 300 kg to the hectare is to be tried.

No parasite has been discovered in the course of the breeding experiments, though these have been fairly abundant. All that has been found is a varied fauna of saprophytic Diptera :— *Sciara* sp. ?, *Helemyza variegata* Lw., *Lonchaea splendida* Lw., *Scatopse* sp. ?, *Drosophila funebris* F., *D. busckii* (*rubrolineata* Beck) [identified by Dr. Villeneuve] and a Staphylinid, *Atheta pertyi* [identified by Mr. de Peyerimhoff].

* In this, as in the next chapter the countries are arranged in French alphabetical order.

(1) Communication from the official correspondent of the Institute, Mr. DEBASSUS, Plant Protection Inspector, General Government of Algeria, Algiers.

Eritrea : Locusts (*Locusta migratorioides* and *Schistocerca gregaria*) (1).

During September 1931 neither on the upland plateau nor in the eastern plain were eggs or hatching reported.

The destruction of the breeding centres reported towards the end of August at Addi Samuel (Seraè) and in the Hazamò plain has been completed.

On 2 and 3 September two swarms of *Locusta migratorioides* passed over Cheren, one from the north flying south-east, the other from the north-east flying south-west.

At Seroà and Menabir in the territory of Cheren on 2 September egg laying by a large swarm of adults was observed, and on the 10th the hatching of hoppers at Sebat Crid.

On 21 September a swarm of *L. migratorioides* coming from the Tigrai crossed over the Mareb and entered the Colony; on the 22nd a swarm of *Schistocerca gregaria* from Dembelas, after passing over Tucul, crossed the frontier.

Infestation of the territories of the western plain was however somewhat serious. Numbers of groups of hoppers were reported in the vicinity of Agordat, Tessenei, in many places along the Gasc and in the Cunama (Barentù, Lacatacura).

On 4 September a swarm coming from the Tigrai flew over Ducambia; on the 10th another swarm coming from the Anglo-Egyptian Sudan flew in the direction of the upper Gasc. A number of gangs under white leadership destroyed large quantities of hoppers with poisoned bait.

There was serious damage to crops in the western plain and in the territory of Cheren.

During the first ten days of the month swarms were reported in the eastern Jeggiù, in Erichiè and Mogetiè (Abyssinia).

Numerous swarms of locusts were reported during October 1931 over the whole territory of the Colony.

The greater number were composed of *L. migratorioides*. Large swarms from the western plains followed as usual up the valleys of the Barca and Gasch to the uplands. After a short stay in the Tzellimà (Seraè), in the neighbourhood of Adi Caièh (Acchelè Guzai) and in the territory of Cheren they flew away again in the direction of the eastern plain.

Numerous breeding centres with hoppers of *L. migratorioides* were reported and destroyed in the Dembelas and in the vicinity of Tucul (Seraè).

Other centres with hoppers of *Schist. gregaria* and *L. migratorioides* were reported in the territories of Cheren, Agordat and Barentù.

On October 1, 9 and 15 swarms of *Schist. gregaria* of uncertain colour penetrated into Eritrean territory from the Anglo-Egyptian Sudan.

Towards the end of the month these locusts had reached the eastern plain.

On October 21 and 23 two swarms, one of which was certainly composed of *Schist. gregaria*, coming from the sea (island of Dalac), after having passed over Uachiro flew towards the west.

On October 15 and 19 two swarms of *L. migratorioides* were reported in the Tabeh valley, in the northern part of the eastern plain, flying from the Aighet mountains in an easterly direction.

On October 2 and 10 numbers of locusts were reported beyond the Abyssinian

(1) Communication from the official correspondent of the Institute, Dr. A. DE BENEDICTIS, Head of the Agricultural Office of Eritrea, transmitted by the Government of the Colony.

frontier coming from the Dankali plain ; they flew towards the territories of Marta Giun, Golba, Mersk and Basciaiciffè (Jeggiú) where they alighted.

Certain crops were seriously damaged.

United States of America : Notes on Plant Diseases (1).

The term 'market pathology' is used in the United States to designate the study of diseases and rots of fruits and vegetables on the market as distinguished from those diseases which occur especially in the field.

Since the inception of the Food Products Inspection Service by the Bureau of Agricultural Economics, increasing attention has been given to this work, which is, of course, carried on chiefly in such large consuming centers as New York and Chicago. The following reports were received from Mr. C. O. Bratley, who is stationed in New York City engaged in the study of market pathology.

During April several steamer shipments of honeydew melons from Chile arrived in New York. The average decay in four of these lots was about 15 per cent. Fusarium was the principal decay. More than half of the decay was found at the stem end of the melon. Apparently the cut stem served as an infection court from which the fungus grew down into the fruit. Frequently only a small decayed area was visible at the stem but on cutting the melon open the seed cavity would be found to be completely filled with white fluffy mycelium.

During June many white cherries from California received in New York showed small rotted areas, each covered with a small tuft of white mycelium. In most cases the decay followed skin punctures. Cultures from this type of decay yielded consistently a species of *Cladosporium* which by inoculation was proved to be definitely pathogenic. The decay produced by the *Cladosporium* developed slowly. Six days after inoculation the areas were approximately 5 mm. in diameter.

For several seasons it has been noted that the appearance of Napoleon cherries from California and the Northwest arriving on the New York market has been marred by the presence of darkened areas in the flesh of the fruit. Sometimes as many as three-fourths of the cherries on the surface of an otherwise perfect pack would be discolored. The blemish appears as a translucent, rather watery brownish discoloration beneath the skin of the cherry. There is no definite line of demarkation between the affected and the healthy tissue. The discoloration of the cherries in the face of the pack is due to pressure by the lid of the lug and is severe only when the pack shows too much bulge. In the interior of the pack the discoloration is found in cherries which have been pressed together in packing. An occasional cherry which has been dented in by its neighbors will be entirely black. In very loosely packed lugs the cherries next to the lid often exhibit a scalded appearance of the epidermis. To determine the amount of bruising necessary to induce the discoloration, several cherries were pressed lightly between two wooden strips. Generally, when a cherry was subjected to a pressure greater than four pounds the discoloration was produced.

(1) Communication from the official correspondent of the Institute, Dr. Neil E. STEVENS, Senior Pathologist, Plant Disease Survey, Bureau of Plant Industry, United States Department of Agriculture, Washington.

India: A Successful Trap for Red Cotton Bugs (*Dysdercus cingulatus*) (1).

Hibiscus abelmoschus when in pods has been found to be very attractive to these bugs which swarm on it from the whole neighbourhood. In the Entomological experimental area one fourth acre each of Cambodia and Acala cottons and one-twenty first acre of *H. abelmoschus* were grown. Daily collections showed that while there were hundreds of bugs on *H. abelmoschus* there would be only a few on cotton.

Further work is in hand and details will be published later on.

Italian Somaliland: Desert Locust (*Schistocerca gregaria*) (2).

On 2 November 1931 swarms of locust coming from Kenya appeared over the territory of Oddur, Bardera and Baidoa. During the following days locusts alighted in the territory of Merca and eggs were deposited.

There was little damage to crops.

Control was carried out with poisoned bait and physical methods.

* * *

A later communication from the Government of Italian Somaliland states that during November throughout the whole country, including Migiurtinia and Nogal, great numbers of swarms were reported and eggs were laid, particularly in the Alto Giuba, the Rahanuen district, in the zone of Baidoa, at Genalè and in the Villaggio Duca degli Abruzzi.

The damage so far has not been serious. Native crops have suffered most, losing the greater part of the harvest.

Control measures are being continued.

LEGISLATIVE AND ADMINISTRATIVE MEASURES

Germany (Brunswick) (3). — The Order No. 102 of 7 September 1931, based on the Law of 7 September 1931, concerning the manufacture and sale of preparations containing bacteria for the control of animal pests, requires a special police permit for the manufacture and sale of such products. Such permits will be granted only to competent persons and in cases of recognized necessity. Premises for the preparation and sale will be under the control of the police and medical authorities. Bacterial cultures for infecting bait as well as the preparations themselves must be kept carefully out of reach of incompetent persons. All infected material must

(1) Communication from the official correspondent of the Institute, Mr. C. C. GHOSH, B. A., F. E. S., Entomologist, Agricultural College, Mandalay, Burma.

(2) Communication from the Royal Government of Italian Somaliland, transmitted by the Ministry for the Colonies ('Ufficio Studi e Propaganda').

(3) Communication from the Biologische Reichsanstalt für Land- und Forstwirtschaft, Berlin-Dahlem, official correspondent of the Institute.

be removed immediately after use, so as to prevent any possibility of dispersion of the bacteria.

Persons producing the preparations must keep up-to-date registers. These registers will serve for the control of the nature and duration of virulence of the cultures used and will make it possible to see clearly the sales and the destinations of the preparations.

Bacterial preparations must be delivered in hermetically sealed glass receptacles or test-tubes and carefully packed. The receptacles must bear a label indicating the control number, the place of production, the nature and duration of the efficacy of the preparation. Each package must be accompanied by directions for use and by a copy of the instructions drawn up by the German Service of Public Health.

It is forbidden to prepare or keep products intended for human use or for domestic animals in premises reserved for the preparation and storage of the culture in question.

Germany (Prussia) (1). — An Order of the Minister of Agriculture, Lands and Forests dated 16 September 1931 contains regulations concerning the use of poisons in fields. It does not prevent the use of preparations of squill nor of poisons against slugs, insects and worms, nor the spreading of poisons from the air.

The use of poisons is authorised in the following cases :— (a) in the control of rats and mice with poisoned seeds, or with phosphorus preparations, that are introduced into their holes or otherwise concealed in such a way as to prevent other animals from reaching them ; (b) in the control of crows and magpies with phosphorus poisoned eggs ; eggs remaining untouched must be collected at latest after three days ; (c) in the control of dogs and wild cats ; for this purpose poisoned carrion may be used. Authorisation will be given solely to the owner of the land or of the game rights on proof that the vermin to be destroyed has done considerable damage ; a notice must be placed wherever poisoned carrion has been distributed.

Places where poisoned bait has been spread must be inspected every day, or, if they are very distant, at least every two days by reliable persons.

Any offences will be punishable. Authorisation may moreover be withdrawn from persons not complying with the regulations or who are found not to be reliable.

Germany (Schleswig Holstein) (1). — By an Order of the First President of the province of Schleswig Holstein dated 12 August 1931, it is established that any person desiring to disinfect with chemicals seed grain for other than his own use shall first obtain a permit from the First President, who will grant it or, when necessary, withdraw it, on the recommendation of the principal Plant Protection Station of Kiel. A list of the persons holding such a permit will be published each year. The premises in which disinfection is carried out are under police control. It is forbidden to use for disinfection preparations and concentrations other than those specified on leaflet No. 7 issued by the Biologische Reichsanstalt für Land- und wirtschaft, Berlin-Dahlem.

England. — By an Order of October 15, 1931 in view of the rapid spread of the Colorado potato beetle (*Leptinotarsa decemlineata*, Say) in France, the importation of potatoes from any part of France into England or Wales is prohibited as from March 15, 1932. Nursery stock and living plants (including bulbs, cuttings,

(1) Communication from the Biologische Reichsanstalt für Land- und Forstwirtschaft, Berlin-Dahlem, official correspondent of the Institute.

etc., but not cut flowers or vegetables for consumption) will be admitted only if they are officially certified not to have been grown within 200 kilometres of any place where *L. decemlineata* exists or has been known to exist; between March 15 and October 14, in each year, the admission of raw vegetables, including tomatoes, onions, aubergines and salads, will be subject to the same restriction. (*Statutory Rules and Orders, 1931, No. 879. The Colorado Beetle Order of 1931. Dated October 15, 1931.* London, 4 pp.).

Western Australia. — On 1st October 1931 (Agric. No. 2070/25; Ex. Co. No. 1762) the Director of Agriculture notified that *Watsonia* has been declared a noxious weed within the boundaries of the Murray Road Board District. (*Government Gazette of Western Australia*, Perth, October 2, 1931, No. 52, p. 2213).

Canada. — By Order of the Governor General dated 21 July 1931 Regulations Nos. 6 and 10 (foreign) and No. 9 (domestic) have been rescinded and replaced by the following :—

(1) Regulation No. 6 (foreign), 1st revision.

It is forbidden to import into Canada from any foreign country any five-leaved species of the genus *Pinus* or garden varieties thereof.

The importation from Europe of the Austrian pine (*P. nigra* Arnold), the Swiss mountain pine (*P. Mugo* Turra), the Scots pine (*P. sylvestris* L.) and their garden varieties is also forbidden.

(2) Regulation No. 10 (foreign), 6th revision.

The importation into Canada of plants or plant parts belonging to the following species coming from the areas specified below is forbidden except in accordance with the conditions set forth in Art. 2 :—

Art. 1. — (a) Maize and broom corn (including all parts of the plant, all millets and Sudan grass) coming from the following States of the United States of America :— Connecticut, Indiana, Maine, Massachusetts, Michigan, New Hampshire, New Jersey, Ohio, Pennsylvania, Rhode Island, Vermont and West Virginia ;

(b) During the period between 1 June and 31 December cut flowers and whole plants of chrysanthemums, asters, cosmos, zinnias, hollyhocks ; cut flowers or whole plants of gladiolus and dahlias with the exception of their bulbs and roots without stems ; oats and rye straw, as such or used as packing material ; celery, green beans in the pod, beets with stems and rhubarb, coming from the States of Connecticut, Maine, Massachusetts, New Hampshire and Rhode Island.

The products listed above may however, by passing through the above-mentioned States, be imported into Canada from any of the United States of America if consigned under direct delivery note, or if accompanied by a certificate signed by an authorised official of the Ministry of Agriculture of the United States or of the Ministry of Agriculture of one of the United States of America, declaring the State of provenance.

Art. 2. — (a) Broom corn for manufacture ; clean grain of maize for seed or as stock feed and clean grain of broom corn may be imported from the States listed in paragraph (a) of Art. 1. Consignments shall, however, be accompanied by a certificate of inspection issued by an authorised official of the Ministry of Agriculture of the United States certifying that the consignment is free from the European corn borer [*Pyrausta nubilalis*].

(b) The products named in paragraph (b) of Art. 1 above may be imported within the time specified ; they shall however be accompanied by a certificate of inspection issued by an official authorised by the Ministry of Agriculture of the United States stating that the consignment is free from the European corn borer. No certificate is required for these products between 1 January and 31 May.

(c) This regulation does not apply to the plants and plant parts specified if they they have been processed or treated in such a way as to remove all risk of their carrying the European corn borer.

(3) Regulation No. 9 (domestic), 1st revision.

Art. 1. — The transport of the satin moth (*Stilpnotia salicis* L.) in any stage of its life history, or of any part of any species, hybrid or garden variety of the genera *Salix* (willow) and *Populus* (poplar), from one to another of the areas mentioned in paragraphs (a) and (b), is forbidden except in accordance with the conditions of Art. 2 below :—

(a) The area composed of the provinces of New Brunswick, Nova Scotia and Prince Edward Island ;

(b) The entire part of the province of British Columbia situated south of a line stretched from the town of Hazelton in a westward direction, passing to the north of the islands of Somerville, Dundas and Langara, and extending to the west of a series of straight lines running from the town of Hazelton to the town of Hope and from there directly south to the Canadian frontier.

The points on the railways to the east of which poplars and willows may not be transported outside the quarantine area are :— Hope on the Canadian National Railway ; Haig, on the Canadian Pacific Railway ; Pemberton, on the Pacific Great Eastern Railway ; and Hazelton, on the Prince Rupert branch of the Canadian National Railway.

No restrictions are imposed on the movement of poplars and willows within the limits of the quarantine area.

Art. 2. — The transport of willows and poplars from points within the quarantine area to points outside the said area may be authorised under one or other of the following conditions :—

(a) If they have been treated in such a way as to remove all risk of transporting the satin moth in any stage of its life history, and if they are accompanied by a certificate issued by an inspector duly nominated under the Destructive Insects and Other Pests Law.

(b) If they are sent from a non-quarantine area on direct delivery note, or if they are imported from a non-quarantine area for immediate re-exportation. (*The Canada Gazette*, Ottawa, August 8, 1931, Vol. LXXV, No. 6, pp. 364-365).

Spain. — By 'orden' of 3 November 1931, coming into force on the 6th of the same month, it is forbidden to import potato tubers, leaves, haulm or peel and their packing materials from Poland, Germany, France and any other European countries infested with the Colorado beetle ('chinche del Colorado', *Leptinotarsa decemlineata*). (*Gaceta de Madrid*, Madrid, 6 noviembre 1931, año CCLXX, núm. 310, pág. 812).

*** By 'orden' of 9 November 1931 it is allowed to import from continental France plants with their roots covered with the smallest practicable quantity of soil, belonging to the Coniferae, Ericaceae, Geraniaceae, Myrtaceae, Palmae, ferns, also magnolias, camellias and other plants which may be sent from Holland

and Belgium in virtue of special concessions (cf. this *Bulletin*, 1930, No. 4, pp. 59-60 ; No. 11, pp. 171-172). The regulations controlling importation from France are practically identical with those already established for Holland and Belgium. (*Gaceta de Madrid*, Madrid, 10 noviembre 1931, año CCLXX, núm. 314, págs. 894 y 895).

Italy. — By Ministerial Decree of 9 September 1931 the Royal Observatories for Plant Diseases referred to in Art. 22 of the Law No. 987 of 18 June 1931 (cf. this *Bulletin*, 1931, No. 9, p. 166) are confirmed at the headquarters and for the districts specified in the Ministerial Decree of 1 July 1929 (cf. this *Bulletin*, 1929, No. 9, pp. 137-138). (*Gazzetta Ufficiale del Regno d'Italia*, Roma, 20 ottobre 1931, anno 72º, n. 243, p. 5122).

* * By Ministerial Decree of 31 October 1931 the commune of Ricigliano in the province of Salerno has been declared infected with grape phylloxera. (*Gazzetta Ufficiale del Regno d'Italia*, Roma, 13 novembre 1931, anno 72º, n. 262, p. 5534).

* * By Ministerial Decree of 5 November 1931 the time limit for the presentation of entries for the competition for the compilation of a manual of diseases of crop plants and a manual of insect pests of crop plants opened by Ministerial Decree of 21 June 1931 (cf. this *Bulletin*, 1931, No. 10, p. 189), has been extended to 15 March 1932. (*Gazzetta Ufficiale del Regno d'Italia*, Roma, 23 novembre 1931, anno 72º, n. 270, p. 5696).

Latvia (1). — A law published on 28 May 1931 (*Waldibas Westnesis*, No 115) makes obligatory the protection of plants. The list of plant diseases and pests and noxious plants to be controlled will be established by the Minister of Agriculture. The inspection of fields, gardens and woods and the supervision of control methods, of importation and exportation of living plants will be undertaken by the Minister. The Minister has also the right of issuing quarantine orders and ordering the destruction of infested crops. Compensation may be granted on the decision of a Commission nominated by the Minister of Agriculture for any damage caused by these measures. The prescribed measures will be carried out by the Minister of Agriculture at the expense of the persons concerned if owners or holders of land fail to comply with the regulations. Offences will be punishable under the penal code.

New Zealand. — By special order made by the Waitaki County Council on the 26 June 1931 and published by the Minister of Agriculture on the 7 July 1931 (Notice No. Ag. 2979), African boxthorn (*Lycium horridum*) is declared to be a noxious weed in the Waitaki County. (*The New Zealand Gazette*, Wellington, July 9, 1931, Numb. 52, p. 2083).

Peru. — By Decree-Law No. 7097 dated 14 April 1931 and by 'resolución' of the 16th of the same month it has been determined that the costs of the campaign for the control of *Diaphania* sp., a Microlepidopteron injurious to the olive in the Ilo Valley, province of Moquegua, shall be provided from the funds of the 'Caja de Depósitos y Consignaciones' up to a sum of 15,000 gold 'soles'. (*La Vida Agrícola*, Lima, 1931, vol. VIII, no. 91, págs. 436 y 437).

(1) Communication from the official correspondent of the Institute, Prof. M. Eglrs, Director of the Phytopathological Laboratory of the University, Riga.

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[This volume, which forms part of the collection of the 'Quinzaine Nationale de la Production Agricole d'Outre-Mer', contains, in addition to the programme of the Congress and the report of the proceedings, the following reports which were delivered at the Congress:—

Les Acridiens migrants (M. P. VAYSSIÈRE). — Les Vertébrés nuisibles aux Colonies (M. CHAPPELLIER). — Organisation de la lutte et mesures de protection prises contre les parasites et maladies des cultures. Améliorations à y apporter. Algérie (MM. DELASSUS et R. PASQUIER). — Les ennemis des cultures en Tunisie (M. CH. CHABROLIN). — Les ennemis des cultures au Maroc (M. REGNIER). — Les ennemis des cultures en Afrique occidentale française (GOUVERNEMENT GÉNÉRAL DE L'A. O. F.). — Les ennemis des cultures en Afrique équatoriale française (GOUVERNEMENT GÉNÉRAL DE L'A. E. F.). — Les ennemis des cultures au Cameroun (COMMISSARIAT DE LA RÉPUBLIQUE FRANÇAISE A YAUNDÉ [CAMEROUN]). — Organisation de la lutte et mesures de protection prises contre les parasites et maladies des cultures. Améliorations à y apporter. Indochine (MM. HUBERT BARAT et ROBERT L. COMMUN). — Les ennemis des cultures en Syrie (DIRECTION DE L'AGRICULTURE ET DES SERVICES ÉCONOMIQUES). — Les ennemis des cultures à Madagascar (MM. CL. FRAPPA et G. BOURIQUET). — Organisation de la lutte et mesures de protection prises contre les parasites et maladies des cultures. Améliorations à y apporter. Ile de la Réunion (M. A. KOPP). — Les ennemis des cultures en Nouvelle-Calédonie, aux Nouvelles-Hébrides, aux Iles Loyautés et aux Iles Wallis (M. RISBEC). — La police sanitaire des végétaux métropolitaine et coloniale dans ses rapports internationaux (M. J.-M. SAULNIER). — L'organisation des recherches entomologiques et phytopathologiques aux Colonies (MM. A. MAUBLANC et P. VAYSSIÈRE). — L'organisation d'un Service météorologique colonial adapté aux besoins agricoles et en particulier à la « lutte contre les ennemis des cultures » (M. le Général DELCAMPRE)].

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[Descriptions in English of 10 new species collected in different countries (Brazil, Union of South Africa and British East Africa)].

NOTES

Forest Pathology at the International Congress of Timber and Forestry, Paris, 1931. — The following recommendations were *inter alia* adopted by the Congress:—

In view of the fact that trees of many genera, particularly *Ulmus*, *Castanea*, *Populus*, *Pseudotsuga* are all to a greater or less degree seriously affected by cryptogamic diseases,

That in each genus there appear to be species, varieties, strains, forms and hybrids that are specially resistant to these diseases,

The Congress expresses the hope,

That experimental work for the discovery of the species, varieties, strains, forms and hybrids having a relatively high degree of resistance, will be organised and carried out in the different regions or countries and more particularly where trees affected by such diseases are to be found.

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1932

AGRICULTURAL ECONOMICS AND SOCIOLOGY

Index to the Monthly Bulletin of Agricultural Economics and Sociology for the Year 1931.

CLASSIFICATION OF THE SUBJECTS

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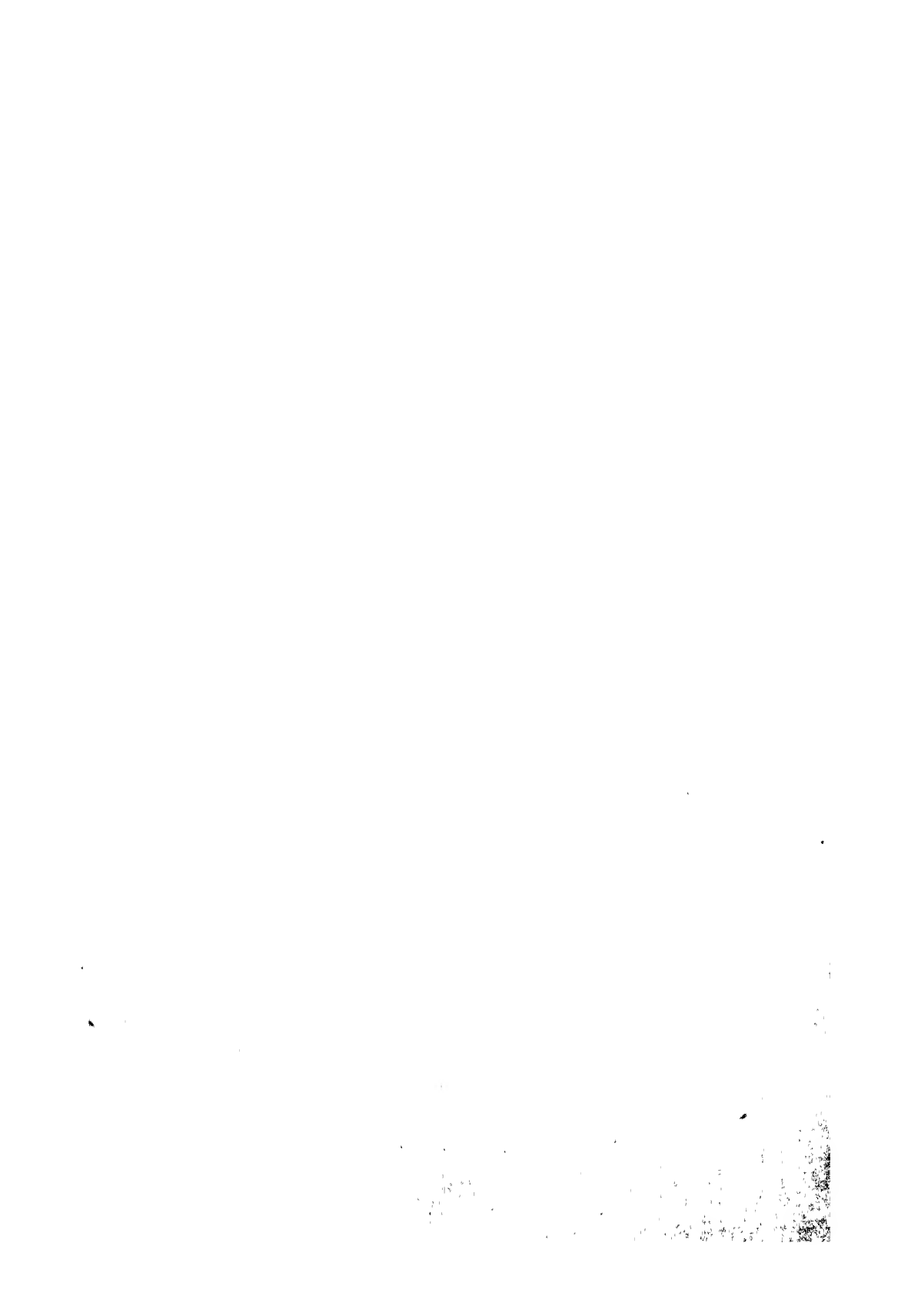
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NOVEMBER: World production of cereals, 659-S.

I. — PRODUCTION.

1. CEREALS.

(Wheat, rye, barley, oats).

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April, 193-S, 221-S.	October, 591-S, 634-S.
May, 253-S, 279-S, 305-S	November, 664-S.
June, 307-S, 370-S	December, 735-S.

2. MAIZE.

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3. RICE.

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June, 321-S, 370-S.	December, 758-S.

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May, 269-S, 279-S, 280-S, 306-S.	November, 678-S, 734-S.
June, 322-S, 370 S.	December, 759-S.

6. VINES.

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May, 272-S, 279-S.	November, 682-S.
June, 325-S, 370-S	December, 763-S.

7. OLIVES.

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April, 218-S, 221-S.	October, 616-S.
May, 274-S, 279-S, 305-S.	November, 685-S.
June, 332-S.	December, 768-S.

8. COTTON.

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February, 92-S, 97-S.	August, 468-S.
March, 152-S, 160-S.	September, 542-S.
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May, 275-S, 279-S, 280-S, 305-S, 306-S.	November, 686-S.
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July, 399-S.
August, 472-S, 403-S
September, 543-S.

October, 623-S
November, 691-S
December, 776-S

July, 403-S
August, 474-S.
September, 547-S

October, 623-S.
November, 691-S.
December, 776-S.

10. TEA.

January, 32-S
February, 94-S.
March, 158-S.
April, 222-S.
May, 277-S, 305-S.
June, 336-S, 370-S.

July, 401-S
August, 476-S.
September, 547-S
October, 623-S.
November, 691-S.
December, 777-S.

11. COFFEE.

January, 32-S.
February, 94-S
March, 159-S.
April, 222-S.
June, 336-S.

August, 477-S
September, 545-S.
October, 624-S.
November 692-S
December, 777-S.

12. CACAO

January, 32-S.
February, 72-S.
March, 159-S.
May, 277-S.
June, 336-S.
July, 401-S.

August, 476-S
September, 548-S
October, 624-S
November, 696-S.
December, 777-S.

13. CCLZA, MUSTARD, SESAMUM, SUNFLOWER AND COCONUTS.

January, 33-S.
February, 95-S
March, 159-S.
April, 223-S.
May, 277-S, 280-S, 305-S.
June, 337-S, 370-S.

July, 402-S
August, 477-S.
September, 549-S.
October, 625-S, 634-S
November, 698-S.
December, 779-S.

14. GROUNDNUTS.

January, 32-S.
April, 222-S.
May, 277-S, 306-S.
June, 337-S.
July, 402-S.

August, 477-S.
September, 549-S
October, 624-S.
November, 697-S.
December, 779-S.

15. JUTE.

April, 223-S.
May, 278-S.
June, 337-S.

August, 475-S.
September, 547-S
October 624-S.

16. HEMP.

January, 34-S.
February, 97 S.
March, 159-S, 160-S.

April, 221-S, 224-S.
May, 278-S, 279-S, 280-S.
June, 339 S.

17. HOPS.

January, 35-S
February, 96-S, 97-S.
March, 160-S
April, 221-S, 224-S
May, 278-S, 279-S, 280-S.
June, 338-S, 370-S.

July, 403-S
August, 479-S.
September, 550-S.
October, 626-S
November, 700-S.
December, 780-S.

18. TOBACCO.

January, 33-S.
February, 96-S, 97-S
March, 159-S, 160-S.
April, 221-S, 223-S.
May, 278-S, 279-S, 280-S
June, 338-S, 370 S

July, 402-S.
August, 478-S.
September, 549-S.
October, 625-S
November, 698-S.
December, 779-S.

19. SERICULTURE.

January, 36-S.
February, 96-S, 97-S.
March, 160-S.
April, 221-S, 224-S.
May, 278-S, 279-S, 305-S.
June, 339-S, 370-S.

July, 404-S.
August, 480-S.
September, 551-S.
October, 627-S.
November, 700-S.
December, 780-S.

20. FODDER CROPS.

January, 37-S
February, 93-S.
March, 161-S.
April, 224-S.
May, 280-S, 305-S, 306-S.
June, 339-S, 370-S.

July, 404-S.
August, 480-S, 493-S.
September, 551-S.
October, 627-S.
November, 703-S.
December, 780-S

II. — LIVESTOCK AND DERIVATIVES.

I. CONDITION OF LIVESTOCK AND DAIRY PRODUCTION.

January, 38-S.
February, 102-S.
March, 170-S.
April, 227-S, 229-S.
May, 283-S.
June, 348-S.

July, 409-S.
August, 486-S.
September, 555-S.
October, 631-S.
November, 706-S.
December, 784-S, 790-S.

2. NUMBER OF LIVESTOCK.

Germany January, 41-S; February, 104-S; April, 228-S; August, 488-S; October, 632-S.
Algeria March, 172-S.
Argentina March, 171-S; June, 350-S.
Belgium May, 284-S.
Canada January, 44-S.

Chile	September, 559-S; November, 711-S; December, 790-S.
Denmark	February, 105-S, August, 488-S; December, 786-S.
Irish Free State	August, 489-S; December, 786-S.
United States.	February, 106-S, November, 710-S.
Great Britain and Northern Ireland	September, 557-S; October, 633-S; November, 709-S.
Guatemala	March, 171-S.
Hungary	August, 490-S.
Italy	February, 105-S.
Kenya	August, 492-S.
Latvia	June, 350-S; December, 787-S.
Norway	October, 634-S.
New Zealand	February, 108-S; August, 492-S.
Netherlands.	August, 491-S.
Poland	March, 170-S; December, 788-S.
Salvador	November, 712-S.
Switzerland	July, 470-S.
Czechoslovakia	April, 228-S; December, 788-S.
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U. S. S. R.	January, 42-S.
Uruguay	May, 284-S.
Yugoslavia	August, 491-S.

III. — TRADE AND STOCKS.

1. MONTHLY IMPORTS AND EXPORTS.

(Wheat, wheat flour, total wheat and flour, rye, barley, oats, maize, rice, cotton, linseed, tea, coffee, cacao, butter, cheese, wool).

January, 45-52-S.	July, 411-418-S.
February, 109-116-S.	August, 494-501-S.
March, 174-181-S.	September, 560-567-S.
April, 230-237-S.	October, 635-642-S.
May, 287-294-S.	November, 713-720-S.
June, 352-359-S.	December, 791-798-S.

2. STOCKS.

January, 53-S.	July, 419-S.
February, 117-S.	August, 502-S.
March, 182-S.	September, 568-S.
April, 238-S.	October, 643-S.
May, 295-S.	November, 721-S.
June, 360-S.	December, 799-S.

IV. — PRICES AND RATES OF OCEAN FREIGHT.

1. MONTHLY REVIEW OF PRICES.

January, 55-S.	July, 421-S.
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